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SESSIONAL PAPERS

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OF THE

PROVINCE OF ONTARIO

SESSION 1913

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LIST OF SESSIONAL PAPERS

ARRANGED ALPHABETICALLY.

TITLE.	NO.	REMARKS.
Accounts, Public	1	*Printed.*
Agricultural College, Report	29	"
Agricultural and Experimental Union, Report	31	"
Agricultural Societies, Report	42	"
Agriculture, Department of, Report	28	"
Algonquin National Park, timber in	91	*Not Printed.*
Archivist, Report	50	*Printed.*
Auditor, Statement	65	"
Bee-Keepers' Association, Report	37	*Printed.*
Births, Marriages and Deaths, Report	19	"
Bruce Mines and Algoma Railway, general character of country	99	*Not Printed.*
Children, Dependent, Report	26	*Printed.*
Colcock, N. B., Correspondence, Reorganization of London Staff	98	*Not Printed.*
Combines, Agreements seized	90	"
Combines, Correspondence seized	111	"
Communicable Diseases, Order-in-Council	96	"
Consolidated Revenue Act, Orders-in-Council	68	"
Corn Growers' Association, Report	35	*Printed.*
Counsel retained at Criminal Assizes	97	*Not Printed.*
Dairymen's Association, Report	38	*Printed.*
Damage Suits against Employers	112	*Not Printed.*
Dempsey, Police Magistrate, complaints	76	"
Division Courts, Report	5	*Printed.*
Dominion Fish Company, correspondence *re* permit for tug	53	*Not Printed.*
Dominion Fish Company, licenses to	102	"
Donnelly, John, Order-in-Council	100	"
Ducks, food supply for	72	"
Education, Report	16	*Printed.*
Education, Orders-in-Council	55	*Not Printed.*
Education, meetings of Advisory Council	67	"

Title.	No.	Remarks.
Education, correspondence *in re* character of teaching in Simcoe, etc.	75	*Not Printed.*
Education, correspondence *re* teaching of French in Plantagenet	77	"
Education, correspondence re granting of certificate to Jean McGregor	87	"
Education, Orders-in-Council appointing John Donnelly and as to printing of School Readers.	100	"
Education, names of Professors of Faculty of Education in Toronto and Queen's Universities; hours of teaching by	113	"
Elections, Return from Records	49	*Printed.*
Elk Lake Branch T. N. O. telegram	58	*Not Printed.*
Entomological Society, Report	36	*Printed.*
Estimates, 1913-14	2	"
Factories, Report	45	*Printed.*
Farmers' Institutes, Report	40	"
Farr, Michael, charges against	63	*Not Printed.*
Feeble-minded, Report	23	*Printed.*
Fernon, B. F., correspondence	33	*Not Printed.*
Fish Company, Dominion, correspondence	53	"
Fish Hatcheries, establishment of	54	"
Forest Rangers and Timber Cullers, number of, etc.	62	"
Fort Frances Lumber Company, Cullers Report	69	"
Friendly Societies, Report of	10(a)	*Printed.*
Fruit Growers' Association, Report	32	"
Game and Fisheries, Report	13	*Printed.*
Grand Juries, presentments	105	*Not Printed.*
Grand River, Local Flow, Report	86	*Printed.*
Grey, County Judge, Surrogate fees	56	*Not Printed.*
Health, Report	20	*Printed.*
Highway Improvement, Report	14	"
Horticultural Societies, Report	43	"
Hospitals and Charities, Report	24	"
Houston, M., charges against	60	*Not Printed.*
Hydro-Electric Power Commission, Report	47	*Printed.*
Hydro-Electric Power Commission, expenses incurred at North Bay	84	*Not Printed.*
Idiots and Epileptics, Report	22	*Printed.*
Industries, Report	44	"
Insane Hospitals, Report	21	"
Insurance, Report	10	"

Title.	No.	Remarks.
James Bay, McMillan's Report	71	*Printed.*
Jeannette, Settlers at	88	*Not Printed.*
Johnston, W. I., appointment of	81	"
Jordan Harbour, Hor. Ex. Station, Resolutions of Board Meeting	109	"
Judges, Supreme Court, increase in number of	64	"
Labour, Report	15	*Printed.*
Lands, Forests and Mines, Report	3	"
Land Titles, instruments registered	94	*Not Printed.*
Lapointe, John, correspondence	103	"
Legal Offices, Report	6	*Printed.*
Library, Report	51	*Not Printed.*
Liquor License Acts, Report	27	*Printed.*
Liquor License Laws, detective work	74	*Not Printed.*
Liquor License Duties, Orders-in-Council, increasing or decreasing, etc.	93	"
Live Stock Association, Report	39	*Printed.*
Lizard Island Preserve, correspondence	53	*Not Printed.*
Loan Corporations, statements	11	*Printed.*
Mines, Report	4	*Printed.*
Mines, Report on underground Labour in	82	"
Mining Industry in Northern Ontario	70	"
Montreal-Cobalt Power Company, correspondence	59	"
Municipal Auditor, Report	8	"
Munn Lumber Company, correspondence	61	*Not Printed.*
McGregor, Jean, correspondence	87	*Not Printed.*
McMillan's Report, James Bay	71	*Printed.*
Notch The, Montreal River, correspondence	59	*Not Printed.*
Ontario Railway and Municipal Board, Report	48	*Printed.*
Ontario Vegetable Growers' Association, Report	34	"
Ontario Veterinary College Report	30	"
Price's Report, Underground Workmen	82	*Printed.*
Prisons and Reformatories, Report	25	"
Provincial Institutions, patients admitted to	66	*Not Printed.*
Provincial Municipal Auditor, Report	8	*Printed.*
Public Accounts	1	"
Public Health, Report	20	"
Public Health, Order-in-Council *re* communicable diseases	96	*Not Printed.*
Public Works Report	12	*Printed.*
Queen Victoria Niagara Falls Park, Report	9	*Printed.*

Title.	No.	Remarks.
Railway and Municipal Board, Report	48	*Printed.*
Registrar General, Report	19	"
Registry Offices, Report	7	"
Road Construction under 2 Geo. V.	80	"
Roads and Bridges in Sudbury, etc.	106	*Not Printed.*
Saw Manufacturers combine	90	*Not Printed.*
Secretary and Registrar, Report	18	*Printed.*
Saunders Report, *re* M. Farr	63	*Not Printed.*
Smoky Falls Water Power, correspondence	57	"
Stamped Ware combine	78	"
Standard Insurance Company, correspondence	104	"
Statute Distribution	108	"
Stone, information against	83	"
Sudbury, Nipissing, etc., roads, bridges and drains in	106	"
Surrogate Court, Orders-in-Council	95	"
Sutherland, Judge, Surrogate Fees	56	"
Tack Combine, information	79	*Not Printed.*
Tack Combine, finding of Grand Jury	92	"
Tavern and Shop Licenses, prohibited	101	"
Timagami Lake, correspondence	107	"
Timber, quantity cut at mileage 81.	52	"
Timber, cut on Munn Limits	61	"
Timber in Algonquin Park	91	"
Timber Cullers, number of	62	"
Timiskaming and N. O. R., Report	46	*Printed.*
Timiskaming and N. O. R., lands owned by Commission	73	"
Timiskaming and N. O. R., Passes issued by	89	*Not Printed.*
Timiskaming and N. O. R., Orders-in-Council reducing Royalties payable to	110	"
Toronto University, Report	17	*Printed.*
Underground Labour, Hours of in Mines, Report	82	*Printed.*
Vegetable Growers' Association, Report	34	*Printed.*
Veterinary College, Report	30	"
Women's Institutes, Report	41	*Printed.*
Workmen's Compensation, Interim Report	85	"

LIST OF SESSIONAL PAPERS

Arranged in Numerical Order with their Titles at full length; the dates when presented to the Legislature; the name of the Member who moved the same, and whether ordered to be Printed or not.

CONTENTS OF PART I.

No. 1 Public Accounts of the Province for the year ending 31st October, 1912. Presented to the Legislature, 26th February, 1913. *Printed.*

No. 2 Estimates—Supplementary, for the service of the Province for the year ending 31st October, 1913. Presented to the Legislature, 28th February and 9th April, 1913. *Printed.* Estimates for the year ending 31st October, 1914. Presented to the Legislature, 14th April, 1913. *Printed.*

CONTENTS OF PART II.

No. 3 Report of the Department of Lands, Forests and Mines, for the year 1912. Presented to the Legislature, 21st April, 1913. *Printed.*

No. 4 Report of the Bureau of Mines for the year 1912. Presented to the Legislature, 28th March, 1913. *Printed.**

No. 5 Report of the Inspector of Division Courts for the year 1912. Presented to the Legislature, 24th February, 1913. *Printed.*

No. 6 Report of the Inspector of Legal Offices for the year 1912. Presented to the Legislature, 25th March, 1913. *Printed.*

CONTENTS OF PART III.

No. 7 Report of the Inspector of Registry Offices for the year 1912. Presented to the Legislature, 21st April, 1913. *Printed.*

No. 8 Report of the Provincial Municipal Auditor for the year 1912. Presented to the Legislature, 1st April, 1913. *Printed.*

No. 9 Report of the Commissioners for the Queen Victoria Niagara Falls Park, for the year 1912. Presented to the Legislature, 25th March, 1913. *Printed.*

No. 10 Report of the Department of Insurance for the year 1912. Presented to the Legislature, 13th March, 1913. *Printed.*

No. 10 (*a*) Report of the Registrar of Friendly Societies for the year 1912. Presented to the Legislature, 13th March, 1913. *Printed.*

*See Part V. for the Report of 1912, printing of which was delayed.

CONTENTS OF PART IV.

No. 11 Loan Corporations Statements made by Building Societies, Loaning, Land and Trust Companies for the year 1912. Presented to the Legislature, 28th February, 1913. *Printed.*

No. 12 Report of the Department of Public Works for the year 1912. Presented to the Legislature, 25th February, 1913.

No. 13 Report of the Department of Game and Fisheries for the year 1912. Presented to the Legislature, 21st February, 1913. *Printed.*

CONTENTS OF PART V.

No. 14 Report upon Highway Improvement for the year 1912. Presented to the Legislature, 21st February, 1913. *Printed.*

No. 15 Report of the Bureau of Labour for the year 1912. Presented to the Legislature, 19th March, 1913. *Printed.*

CONTENTS OF PART VI.

No. 16 Report of the Department of Education for the year 1912. Presented to the Legislature, 4th March, 1913. *Printed.*

No. 17 Report of Board of Governors of University of Toronto for the year ending 30th June, 1912. Presented to the Legislature, 13th February, 1913. *Printed.*

CONTENTS OF PART VII.

No. 18 Report of the Secretary and Registrar of the Province for the year 1912. Presented to the Legislature, 3rd April, 1913. *Printed.*

No. 19 Report of Registrar General upon Births, Marriages and Deaths, for the year 1912. Presented to the Legislature. 4th March, 1913. *Printed.*

No. 20 Report of the Board of Health for the year 1912. Presented to the Legislature, 15th April, 1913. *Printed.*

No. 21 Report upon the Hospitals for the Insane for the year 1912. Presented to the Legislature, 3rd April, 1913. *Printed.*

No. 22 Report upon the Hospitals for Idiots, Orillia, and Epileptics, Woodstock, for the year 1912. Presented to the Legislature, 3rd April, 1913. *Printed.*

CONTENTS OF PART VIII.

No. 23 Report upon the Feeble-Minded for the year 1912. Presented to the Legislature, 3rd April, 1913. *Printed.*

No. 24 Report upon the Hospitals and Charities for the year 1912. Presented to the Legislature, 9th April, 1913. *Printed.*

No. 25 Report upon the Prisons and Reformatories for the year 1912. Presented to the Legislature, 3rd April, 1913. *Printed.*

No. 26 Report upon the Neglected and Dependent Children for the year 1912. Presented to the Legislature, 25th March, 1913. *Printed.*

No. 27 Report upon the operation of the Liquor License Acts for the year 1912. Presented to the Legislature, 28th February, 1913. *Printed.*

CONTENTS OF PART IX.

No. 28 Report of the Department of Agriculture for the year 1912. Presented to the Legislature, 17th April, 1913. *Printed.*

No. 29 Report of the Agricultural College and Experimental Farm for the year 1912. Presented to the Legislature, 17th April, 1913. *Printed.*

No. 30 Report of the Veterinary College for the year 1912. Presented to the Legislature, 17th April, 1913. *Printed.*

No. 31 Report of the Agricultural and Experimental Union for the year 1912. Presented to the Legislature, 17th April, 1913. *Printed.*

No. 32 Report of the Fruit Growers Association for the year 1912. Presented to the Legislature, 17th April, 1913. *Printed.*

No. 33 Return to an Order of the House of the 5th March, 1913, for a Return of copies of all correspondence between the Government, or any member thereof, and Dr. F. B. Fernow, regarding Reforestry work, or any class of work on behalf of the Government of Ontario, in any capacity. Presented to the Legislature, 22nd April, 1913. *Mr. Gamey. Not printed.*

No. 34 Report of the Vegetable Growers' Association for the year 1912. Presented to the Legislature, 17th April, 1913. *Printed.*

No. 35 Report of the Corn Growers' Association for the year 1912. Presented to the Legislature, 17th April, 1913. *Printed.*

CONTENTS OF PART X.

No. 36 Report of the Entomological Society for the year 1912. Presented to the Legislature, 17th April, 1913. *Printed.*

No. 37 Report of the Bee-keepers' Association for the year 1912. Presented to the Legislature, 17th April, 1913. *Printed.*

No. 38 Report of the Dairymen's Association for the year 1912. Presented to the Legislature, 17th April, 1913. *Printed.*

No. 39 Report of the Live Stock Association for the year 1912. Presented to the Legislature 20th February, 1913. *Printed.*

No. 40 Report of the Farmer's Institutes for the year 1912. Presented to the Legislature, 20th February, 1913. *Printed.*

No. 41 Report of the Women's Institutes for the year 1912. Presented to the Legislature, 20th February, 1913. *Printed.*

CONTENTS OF PART XI.

No. 42 Report of the Horticultural Societies for the year 1912. Presented to the Legislature, 17th April, 1913. *Printed.*

No. 43 Report of the Agricultural Societies for the year 1912. Presented to the Legislature, 20th February, 1912. *Printed.*

No. 44 Report of the Bureau of Industries for the year 1912. Presented to the Legislature, 17th April, 1913. *Printed.*

No. 45 Report of the Inspector of Factories for the year 1912. Presented to the Legislature, 17th April, 1913. *Printed.*

CONTENTS OF PART XII.

No. 46 Report of the Temiskaming and Northern Ontario Railway Commission for the year 1912. Presented to the Legislature, 13th March, 1913. *Printed.*

No. 47 Report of the Hydro-Electric Power Commission for the year 1912. Presented to the Legislature, 6th March, 1913. *Printed.*

No. 48 Report of the Ontario Railway and Municipal Board, for the year 1912. Presented to the Legislature, 15th April, 1913. *Printed.*

CONTENTS OF PART XIII.

No. 49 Return from the Records of the Elections held on the 28th October, 5th November, 1912, and 19th March, 1913. Presented to the Legislature, 4th February and 26th March, 1913. *Printed.*

No. 50 Report of the Archivist for the year 1912. Presented to the Legislature, 21st April, 1913. *Printed.*

No. 51 Report of Librarian upon the State of the Library for the year 1912. Presented to the Legislature, 5th February, 1913. *Not printed.*

No. 52 Return to an Order of the House of the 11th April, 1912, for a Return shewing: 1. The quantity of pine timber cut at or near mileage 81 on the Timiskaming and Northern Ontario Railway during each of the seasons 1907-1908, 1908-1909, 1909-1910, 1910-1911, by the North Land Mining Company, Limited. 2. The price at which the said pine timber was sold to the said Company in each of the said seasons. 3. The names of the persons by whom the pine cut in each of the said seasons by the said Company was measured for the Government. 4. The names of the original incorporators of the said Company and the names of its shareholders and directors in each of the years 1907, 1908, 1910, 1911 and 1912. Presented to the House 13th February, 1913. *Mr. Mageau. Not printed.*

No. 53 Return to an Order of the House of the 9th April, 1912, for a Return of Copies of all correspondence, official or unofficial, reports and written memoranda of every kind passing between the Government or any Minister or officer thereof and any other person or corporation with respect to:—(*a*) The granting of a permit for a tug owned by the Dominion Fish Company to fish on what is known as "the Lizard Island Preserve," during the season 1911, and copy of such permit. (*b*) The granting of a permit or permits to any other body or person or corporation to fish upon the said Lizard Island Preserve during the season 1911, together with copies of such permits. (*c*) The granting of permits to move the tugs of the Dominion Fish Company from one fishing ground to another, in either of the years 1909, 1910, 1911, with copies of such permits. (*d*) The issue of permits permitting the removal of tugs or other fishing boats owned by persons or corporations other than the Dominion Fish Company from one fishing ground to another during the seasons 1909, 1910, 1911, with copies of such permits. (*e*) The issue of a license to a Canadian-owned tug or boat to fish in waters of the Lizard Island Preserve in either of the seasons of 1911 or 1912, with copy of such license, if any. (*f*) The issue of licenses or permits to use 5-lb. or 6-lb. nets on the said Lizard Island Preserve during the seasons of 1911 and 1912, with copies of such licenses or permits. Presented to the Legislature, 13th February, 1913. *Mr. Mageau. Not printed.*

No. 54 Return to an Address to His Honour the Lieutenant-Governor of the sixth day of March, 1911, praying that he will cause to be laid before this House, a Return of copies of all correspondence between the Province of Ontario and the Dominion of Canada, regarding the establishment of Fish Hatcheries in Ontario. Presented to the Legislature, 13th February, 1913. *Mr. Gamey. Not printed.*

No. 55 Copies of Orders in Council and Regulations to be laid before the Legislative Assembly as required by section 27 of the Department of Education Act. Presented to the Legislature, 13th February, 1913. *Not printed.*

No. 56 Copy of an Order in Council approved by His Honour the Lieutenant-Governor the thirtieth day of April, A.D. 1912, pursuant to provisions of Subsection 3 of Section 78 of the Surrogate Courts Act, Chapter 31, 10 Edward VII., that there be paid to His Honour C. F. Sutherland, of the County Court of the County of Grey, from year to year during his tenure of Office, the Surplus Surrogate Fees over and above the amount payable by Statute to the Surrogate Judge of the said County of Grey, provided, however, that the sum paid out of the said Surplus Surrogate Fees shall not in any year exceed the sum of six hundred and sixty-six dollars ($666.00). Presented to the Legislature, 14th February, 1913. *Not printed.*

No. 57 Return to an Order of the House of the 11th April, 1912, for a Return of copies of (1) All correspondence passing between the Government or any Minister or official thereof or any commission under the Government or any official thereof and any other person or corporation with respect to the development of the Smoky Falls Water Power on the Sturgeon River for the benefit of the Town of North Bay. Presented to the Legislature, 17th February, 1913. *Mr. Mageau. Not printed.*

No. 58 Return to an Order of the House of the 17th day of February, 1913, for a Return shewing whether the Prime Minister or any person on his behalf received a telegram purporting to be from one Rowlandson of Elk Lake between the 1st and 11th days of December, 1911, addressed to the Prime Minister with reference to the building of the Elk Lake Branch of the Timiskaming and Northern Ontario Railway. 2. If such telegram was received, the contents of such telegram. 3. If such telegram was received, did the Prime Minister or any person in his name or with his authority or knowledge or on his behalf send a telegram in reply to the said Rowlandson. 4. If so, the date of such telegram and the contents thereof. Presented to the Legislature, 17th February, 1913. *Mr. Elliott. Not printed.*

No. 59 Return to an Order of the House of 2nd April, 1912, for a Return of copies of all correspondence between any person or persons whatever and the Government of Ontario, or any Minister or Official thereof, with respect to the water power on the Montreal River, known as the "Notch" and all applications for a lease of the said water power and any and all leases issued, assignments of any such leases and all other papers and documents in any way relating to the said "Notch" water power or to the Montreal-Cobalt Power Company, Limited, since the 1st day of January, 1905. Presented to the Legislature, 18th February, 1913. *Mr. Mageau. Not printed.*

No. 60 Return to an Order of the House of the 28th March, 1912, for a Return of Copies of (1) All correspondence between the Department of the Attorney-General or any official thereof and any other person whatsoever with respect to certain charges against M. Houston, one time Police Magistrate for the City of Chatham. (2) All charges against the said M. Houston. (3) All Commissions issued, evidence taken and documents submitted in connection with the said charges and the dismissal of the said M. Houston from his office as Police Magistrate. Presented to the Legislature, 18th February, 1913. *Mr. Richardson. Not printed.*

No. 61 Return to an Order of the House of the 20th March, 1912, for a Return of Copies of: 1. All correspondence, reports, estimates or returns of any kind and from any source respecting the quantity of timber cut upon the Munn limits in the seasons of 1909-10, 1910-11 and 1911-12. 2. The amount received by the Government of Ontario for timber dues, stumpage, rentals, or otherwise howsoever in connection with the said limits in each of the financial years 1909-10-11 with full details. 3. The Annual Return made to the Department of the Provincial Secretary by the Munn Lumber Company, Limited, for the years 1909, 1910 and 1911. Presented to the Legislature, 21st February, 1913. *Mr. Sinclair. Not printed.*

No. 62 Return to an Order of the House of the 11th March, 1912, for a Return showing:—1. (*a*) The number of Forest Rangers and Timber Cullers employed by the Government of Ontario in the seasons of 1903-4 and 1904-5. (*b*) The number of feet of timber measured in each season. (*c*) The amount of money paid in each of the said seasons to (1) Forest Rangers, (2) Timber Cullers. 2. Also showing all the information hereinbefore asked for with respect to the seasons 1909-10 and 1910-11. Presented to the Legislature, 21st February, 1913. *Mr. Mageau, Not printed.*

No. 63 Return to an Order of the House of the 17th February, 1913, for a Return of a Copy of the Report made by Mr. E. Saunders, appointed to investigate into certain charges made by Michael Farr of an attempt made to procure money from him in consideration of a license being renewed for the Union Hotel in the Town of Goderich, together with copies of all correspondence which passed between the Government and any person in reference to the said license or the said investigation, the evidence taken by Mr. Saunders and generally all papers, letters, memoranda or papers of any kind and description relating to the said license, including all papers, and correspondence relative to the refusal of a renewal of such license. Presented to the Legislature, 21st February, 1913. *Mr. Proudfoot. Not printed.*

No. 64 Return to an Order of the House of thirteenth day of April, 1912, for a Return of:—(*a*) All memorials, resolutions, letters or other written memoranda received by the Government or any Minister or official thereof since the 1st day of January, 1910, from any individual, public officer or organization with respect to the increase of the number of Judges of the Supreme Court of Judicature for Ontario or with respect to the changes in the constitution of the Supreme Court of Judicature for Ontario provided for in sections 1 to 19 inclusive, of The Law Reform Act, 1909. (*b*) Copies of all letters or written memoranda from the Government or any Minister or official thereof to any individual, public officer, or organization with respect to the said two subject matters, or either of them, since the said date. Presented to the Legislature, 26th February, 1913. *Mr. Elliott. Not printed.*

No. 65 Statement of the Auditor made pursuant to the provisions of Section 13, subsection 2, of the Audit Act as amended by Section 6, of Chapter 10, 9 Edward VII. Presented to the Legislature, 28th February, 1913. *Printed.*

No. 66 Return to an Order of the House of the 14th March, 1912, for a Return showing:—How many male patients have been admitted to each of the Provincial Institutions for the Insane, Feeble Minded, and Epileptics during the three years beginning Jan. 1st, 1909, and ending Dec. 31st, 1911. How many female patients were admitted to these institutions during the same years. How many male patients were discharged from each of these institutions during the same three years. How many female patients were discharged from each of these institutions during these years. Of these male patients discharged: 1st. How many were discharged recovered; 2nd. How many were discharged improved; 3rd. How many were discharged unimproved. Of the female patients discharged: 1st. How many were discharged recovered; 2nd. How many were discharged improved; 3rd. How many were discharged unimproved. Of the female patients discharged how many were under 45 years of age. Of the patients admitted to each of these institutions during the years 1909, 1910 and 1911 how many were admitted for the first time. How many were admitted for the second time. How many were admitted for the third time. How many had been admitted more than three times. In how many of these cases admitted during these years is there evidence that the patients have become the father or mother of children after the first attack of insanity. In how many of these patients is there a history of insanity, epilepsy or imbecility in the father, mother, brother or sister of the patient. In how many of these patients is there a history of insanity, epilepsy or imbecility in the children of the patients. How many patients are in each of these institutions who have had a father,

mother, son or daughter in an asylum at some time. Presented to the Legislature, 28th February, 1913. *Mr. Godfrey. Not printed.*

No. 67 Return to an Order of the House of the 19th February, 1913, for a Return showing:—1. The number of meetings of the Advisory Council of Education held in each of the years 1909, 1910, 1911 and 1912. 2. The total number of meetings attended by each of the different members of this Council during each of the said years. 3. The total number of votes received by each candidate for representative of the public school teachers and for each candidate for representative of the high school teachers for each of the said years. Presented to the Legislature 28th February, 1913. *Mr. Marshall. Not printed.*

No. 68 Orders in Council issued under the provisions of Section 10 of Cap. 2, 2 George V. Presented to the Legislature, 3rd March, 1913. *Not printed.*

No. 69 Return to an Order of the House of the 3rd March, 1913, for a Return showing:—1. Copies of the Culler's report made by the Fort Frances Lumber Company for the logging seasons of 1909-10, 1910-11, 1911-12. Presented to the Legislature, 4th March, 1913. *Mr. Kohler. Not printed.*

No. 70 The Mining Industry in that part of Ontario served by the Timiskaming and Northern Ontario Railway for the year 1913. Presented to the Legislature, 11th March, 1913. *Printed.*

No. 71 Report of T. G. McMillan, covering investigations at James' Bay during 1912. Presented to the Legislature, 11th March, 1913. *Printed.*

No. 72 Report on the increase of the food supply for Ducks in Northern Ontario by G. R. Mickle, with description of edible plants by R. B. Thompson. Presented to the Legislature, 11th March, 1913. *Printed.*

No. 73 A Return to an Order of the House of the 26th February, 1913, for a Return showing: 1. All lands (other than the Railway's right of way) owned by the Timiskaming and Northern Ontario Railway Commission situate in the various municipalities of the Province, stating the municipality in which the land is situate, the area and estimated value of the land, and showing which are mineral lands, agricultural lands and town lots. 2. All lands (other than the Railway's right of way) owned by the Timiskaming and Northern Ontario Railway Commission situate in any unorganized territory within the Province, stating the unorganized territory in which the land is situate, the area and estimated value of the land, and showing which are mineral lands, agricultural lands and town lots. Presented to the Legislature, 10th March, 1913. *Mr. Atkinson. Not Printed.*

No. 74 Return to an Order of the House of the 3rd March, 1913, for a Return showing:—1. How much the Government has spent on private detective work in each of the years 1910, 1911 and 1912. 2. How much of the amount mentioned in the first paragraph hereof, has been spent by the Government in connection with the administration of the Liquor License Laws. 3. What amount was recovered in fines and penalties under the Liquor License Act, in each of the years 1910, 1911 and 1912. Presented to the Legislature, 12th March, 1913. *Mr. McQueen. Not printed.*

No. 75 Return to an Order of the House of the 11th April, 1912, for a Return of copies of all correspondence between the Government and any Minister or Official thereof with respect to the character, efficiency or teaching in the Schools in Simcoe, Stormont, Prescott, Russell and Glengarry Counties since January 1st, 1910. Of all orders, regulations, provisions or other means authorized or directed by the Government or any member or official thereof, to meet or in consequence of any of the said memorials, resolutions, affidavits, protests, charges or complaints. The schools in the said Counties from which the Provincial grant was withheld in the years 1910 and 1911 respectively. The reports or other evidence upon which grants were paid in 1911 to any schools in the said counties from which grants had been withheld in 1910. Presented to the Legislature, 14th March, 1913. *Mr. Elliott. Not printed.*

No. 76 Return to an Order of the House of the 14th March, 1913, for a Return of copies of: 1. All complaints from any other person or persons received in the years 1911 and 1912 by the Government or any Member of the Government regarding the conduct of Police Magistrate Dempsey. 2. All prosecutions instituted or carried on before Superintendent Rogers as a special magistrate within the Town of Cochrane during the years 1911 and 1912. 3. All protests filed with the Government, with the Prime Minister, the Provincial Secretary, Attorney-General or any other Member of the Government by the corporation of the Town of Cochrane, the Board of Trade or the citizens of the Town of Cochrane against the action of Superintendent Rogers in exercising or assuming to exercise jurisdiction within the Town of Cochrane as a special magistrate. Presented to the Legislature, 14th March, 1913. *Mr. Sinclair. Not printed.*

No. 77 Return to an Order of the House of the 26th February, 1913, for a Return of copies of all correspondence between the Department of Education, the Minister of Education himself, and the Board of Trustees of the Schools of the Village of Plantagenet since the 1st day of March, 1905, up to the 1st day of December, 1908, regarding the Teaching of French. Presented to the Legislature, 17th March, 1913. *Mr. Evanturel. Not printed.*

No. 78 Return to an Order of the House of the 24th February, 1913, for a Return of (1) Copies of the letters referred to on the last page of the brief furnished to the Attorney-General by the Crown Counsel in the proceedings against the Stamped Ware Association, showing offences under the different subsections of Section 520 of the Criminal Code, each incriminating letter being marked *a, b, c,* or *d,* as it discloses an offence against a subsection. The said brief forms part of Return 82, Session 1912. (2) Copies of all correspondence between the Crown Counsel and the Government with reference to prosecution of the said combine and all correspondence containing instructions, if any, from the Government not to prosecute. Presented to the Legislature, 17th March, 1913. *Mr. Elliott. Not printed.*

No. 79 Return to an Order of the House of the 14th March, 1913, for a Return of: (1) A copy of the information, depositions and proceedings before the Police Magistrate of Toronto (including the warrant of commitment) with respect to the members of the Tack Combine who were committed for trial by the Police Magistrate of the City of Toronto. (2) Copies of all correspondence passing between the Attorney-General or any one on his behalf or on behalf of the Government and Mr. Du Vernet, K.C., Crown Counsel, or anyone on his behalf with reference to the trial of the members of the Tack Combine. Presented to the Legislature, 17th March, 1913. *Mr. Rowell. Not printed.*

No. 80 Report on Road Construction under 2 George V. Cap. 2, being Consolidated Revenue Act of Ontario. Presented to the Legislature, 19th March, 1913. *Printed.*

No. 81 Return to an Order of the House of the 12th March, 1913, for a Return showing:—Copies of all correspondence between the Chairman or any other member of the T. & N. O. Railway Commission or any other person on their behalf and any official or employee of the T. & N. O. Railway at North Bay relative to the appointment of W. I. Johnston to his present position with the T. & N. O. Railway at North Bay, Ont. Presented to the Legislature, 19th March, 1913. *Mr. Munro. Not printed.*

No. 82 Report of S. Price *re* limitation of hours of Labour of underground workmen in the Mines of Ontario. Presented to the Legislature, 20th March, 1913. *Printed.*

No. 83 Return to an Order of the House of the 7th March, 1913, for a Return showing:—1. Copy of the information laid against one Stone before the Police Magistrate at Collingwood, in January, 1913, for an alleged violation of the Liquor License Act. 2. Copy of the judgment of the magistrate. Presented to the Legislature, 28th March, 1913. *Mr. Anderson (Bruce.) Not printed.*

No. 84 Return to an Order of the House of the 26th February, 1913, for a Return showing:—1. All expenses incurred by the Hydro-Electric Power Commission, or the Government, or by any person or persons on their behalf, in connection with the passing of the Hydro-Electric By-law at North Bay in January, 1913, or for the purpose of procuring the passage of such By-law, or otherwise connected with the submission of such By-law to the electors of North Bay. 2. The names of all persons employed by the Hydro-Electric Power Commission who were in or visited the Town of North Bay during the months of December or January last, and the purposes for which they were employed in the Town of North Bay, and the amounts that were paid to each of them for their services there. 3. Copies of all correspondence between the Hydro-Electric Power Commission, or the Government, or any person or persons on behalf of the Hydro-Electric Power Commission, or the Government, and the Council of the Town of North Bay, or any person on behalf of the said Council, relating to the Hydro-Electric By-law. Presented to the Legislature, 1st April, 1913. *Mr. Mageau. Not printed.*

No. 85 Further interim Report of the Commissioner on the subject of Compensation to Workmen for Injuries sustained in the course of their employment, together with draft Bill, embodying the Commissioner's conclusions. Presented to the Legislature, 2nd April, 1913. *Printed.*

No. 86 A preliminary study by H. G. Acres, of the Hydro-Electric Power Commission, dealing with the possibility of improving the general regimen and local flow characteristics of the Grand River, by means of Storage and Training Works. Presented to the Legislature, 3rd April, 1913. *Not printed.*

No. 87 Return to an Order of the House for a Return showing:—Copies of all correspondence passing between the Department of Education or the Minister or any official thereof and J. Russell McGregor of Gore Bay (President of the Manitoulin Conservative Association), the Public School Board of Gore Bay, the Public School Inspector in Manitoulin or any other person concerning the granting of a temporary teacher's certificate to one Jean McGregor. 2. A copy of the temporary certificate or temporary certificates granted to the said Jean McGregor. 3. Copy of the Departmental Regulations under which the Minister acted in granting the temporary certificate to the said Jean McGregor. 4. Copies of all advertisements (stating the dates of the same), inserted in any paper or papers prior to the granting of such temporary certificate to Jean McGregor, as required by subsection 2 of section 2 of Circular 30½, dated 7th May, 1912, issued by the Department of Education. 5. The evidence (if any) which the Minister had before him at the time such tem-

porary certificate was granted, that the school board had " taken due measures to obtain a teacher with the prescribed grade of certificate," before the Inspector made his recommendation that Jean McGregor should be granted a temporary certificate. Presented to the Legislature, 4th April, 1913. *Mr. Marshall. Not printed.*

No. 88 A return to an Order of the House of the 21st February, 1913, for a Return showing:—1. All petitions, letters and other documents passing between the British settlers at Jeannette, Kent County, Ontario, and the Premier, the Minister of Agriculture, or any other member of the Government, or any officer or official thereof. 2. All reports by any officer or official of the Government on conditions at Jeannette. 3. All correspondence with the Department of Colonization, the Minister of Agriculture, or any officer or official of the Government in reference to the conditions at Jeannette. Presented to the Legislature, 7th April, 1913. *Mr. Anderson (Bruce.) Not printed.*

No. 89 Return to an Order of the House of the 26th February, 1913, for a Return showing:—1. The number of passes issued by the Timiskaming and Northern Ontario Railway Commission over its line of railway or any part thereof during the period from July 1st, 1911, to 1st July, 1912. 2. The persons to whom the said passes were granted. 3. The purpose for which each of the said passes was granted. Presented to the Legislature, 7th April, 1913. *Mr. Mageau. Not printed.*

No. 90 Return to an Order of the House of the 10th March, 1913, for a Return showing:—1. Copies of the agreements entered into by the members of the following combines and seized by the Toronto Police: (*a*) The Saw Manufacturers' Association; (*b*) The Canadian Churn Manufacturing Association; (*c*) The Hame and Saddlery Hardware Manufacturing Association. 2. Copies of all correspondence between the Attorney-General or any other Member of the Government and any counsel with reference to the prosecution of the said combines. Presented to the Legislature, 8th April, 1913. *Mr. Elliott. Not printed.*

No. 91 Return to an Order of the House of the 2nd April, 1913, for a Return showing:—Copies of all reports received by or in the possession of the Government upon the timber in Algonquin National Park covered by the following agreements:—1. Agreement dated 18th June, 1912, between the Crown and the Bank of Montreal. 2. Agreement dated 15th June, 1912, between the Crown and J. R. Booth. 3. Agreement dated 4th June, 1912, between the Crown and H. Stikeman, General Manager of the Bank of British North America. Presented to the Legislature, 8th April, 1913. *Mr. Marshall. Not printed.*

No. 92 Return to an Order of the House of the 3rd April, 1913, for a Return showing:—The findings of the Grand Jury in the prosecution against the Tack Combine. Presented to the Legislature, 8th April, 1913. *Mr. Sinclair. Not printed.*

No. 93 Return to an Address to His Honour the Lieutenant-Governor of the third day of April, 1913, praying that he will cause to be laid before this House, a Return of copies of all Orders in Council passed during the years 1906, 1907, 1908, 1909, 1910, 1911, 1912, increasing or decreasing the duties payable for tavern or shop licenses in any Provincial or Judicial District or in any municipality or locality situated therein, under authority of 6 Edw. VII., Chap. 47, Sec. 10 (1), and showing in respect to every such Order in Council: (*a*) the date of the same, (*b*) the name of the person holding the shop or tavern license affected by the said Order in Council, (*c*) the place where such shop or tavern license was held, (*d*) the amount of license fee as fixed by such Order in Council, (*e*) the amount of the license fee previous to such increase. Presented to the Legislature, 8th April, 1913. *Mr. Anderson (Bruce.) Not printed.*

No. 94 Return to an Order of the House of the 14th March, 1913, for a Return showing:—1. The number of instruments registered in each of the years 1909, 1910, and 1911, in the Land Titles Office, at Toronto. 2. The total amount of fees received in each of the said years. 3. The total amount of disbursements for each such year. 4. The amount of the Guarantee Fund. 5. The total losses. 6. The number of Plans of sub-division. Presented to the Legislature, 9th April, 1913. *Mr. Proudfoot. Not printed.*

No. 95 Copies of Orders-in-Council in accordance with the provisions of subsection 6 of section 78 of the Surrogate Courts Act. Presented to the Legislature, 14th April, 1913. *Not printed.*

No. 96 Copy of an Order in Council approved by His Honour the Lieutenant-Governor, the 3rd day of April, A.D. 1913, approving of the accompanying regulation, being a regulation of the Provincial Board of Health, for the control of Communicable Diseases under the provisions of the Public Health Act, Chapter 58, 2 George V. Also Regulations of the Provincial Board of Health, Ontario, approved by His Honour the Lieutenant-Governor in Council on the 10th day of August, 1912. Presented to the Legislature, 14th April, 1913. *Not printed.*

No. 97 Return to an Order of the House of the 19th February, 1913, for a Return showing:—1. The names of all Counsel retained on behalf of the Crown at any criminal assize in the Province during the year ending 31st December, 1912. 2. The Assize at which each Counsel was so retained. 3. The amount paid

to every such Counsel for services rendered to the Crown at every such assize. 4. The names of all Solicitors or Counsel employed or retained by the Crown for any other purposes during the year ending 31st December, 1912, showing:—(*a*) The amount paid to every such Solicitor or Counsel. (*b*) The matter in respect of which such Counsel or Solicitor was so employed or retained. 5. The total amounts paid to Counsel for the Crown in criminal or other proceedings for the years 1910, 1911 and 1912. Presented to the Legislature, 14th April, 1913. *Mr. Richardson. Not printed.*

No. 98 Return to an Order of the House of the 9th April, 1913, for a Return showing:—1. Copies of all correspondence during the past year between the Minister of Agriculture or any other member or official of the Government and N. B. Colcock (formerly employed in the London Office of the Colonization and Emigration Branch) relating to the reorganization of the London Office, to the staff thereof, or to the resignation of the said Colcock, or to his dismissal from office, or to his retirement from the service of the Government, or to any other matters connected therewith. 2. Copies of all correspondence during the last year between the Minister of Agriculture or any other member or official of the Government and any other person or persons relating to the matters aforesaid. Presented to the Legislature, 15th April, 1913. *Mr. Anderson (Bruce.) Not printed.*

No. 99 Return to an Order of the House of the 15th April, 1913, for a Return showing:—Copies of all reports received by the Government and other information in the possession of the Government: 1. In reference to the general character of the country through which the projected line of the Bruce Mines and Algoma Railroad runs, and of the lands proposed to be granted to the said railway. 2. In reference to the extent and character of the different classes of timber on said lands. 3. In reference to the extent and character of the agricultural lands within the said areas. 4. In reference to the portion of the Mississagi Forest Reserve through which the projected line will pass and the effect that the construction of the said line will have upon the timber in the said Reserve. 5. The estimated length of the said line and the total estimated area of land to be granted to the said railway company. 6. In reference to the surveys already made, and the probable route of the said railway. 7. The names of the parties at present interested in or owning the said railway and who are responsible for its promotion with full information as to their business occupation and financial standing. 8. The character of the plants, mills or other industries upon which the railway undertakes to expend $3,500,000 and the site or sites where it is proposed to locate the same; and if the parties now interested in the railway are the parties who

are to control the industries proposed to be established. Presented to the Legislature, 17th April, 1913. *Mr. Atkinson. Not printed.*

No. 100 Copies of Orders in Council approved by His Honour the Lieutenant-Governor the 12th day of April, A.D. 1913, appointing John Donnelly, Esquire, one of the Governors of the School of Mining, Kingston, in the room and stead of H. W. Richardson, resigned, and Agreements made between the Canada Publishing Company and His Majesty the King, respecting the right to print, publish and supply the Ontario High School English Grammar, and the Ontario High School Reader; also, an Agreement between the Copp, Clark Company, Ltd., and His Majesty the King, respecting the right to print, publish and supply the Ontario High School Reader. Presented to the Legislature, 18th April, 1913. *Not printed.*

No. 101 Return to an Order of the House of the 2nd April, 1913, for a Return showing:—All tavern and shop licenses, the renewal of which has been prohibited by the Provincial Secretary under Section 23 of 6 Edward VII., Chapter 47, as amended by Section 13 of 1 George V. Chap. 64. Presented to the Legislature, 18th April, 1913. *Mr. Proudfoot. Not printed.*

No. 102 Return to an Order of the House of the 27th March, 1913, for a Return showing:—Copies of all licenses or permits granted by the Game and Fisheries Department to the Dominion Fish Company, or to any person on its behalf during the seasons 1910, 1911 and 1912. Presented to the Legislature, 18th April, 1913. *Mr. Clarke. Not printed.*

No. 103 Return to an Order of the House of the 9th April, 1913, for a Return showing:—1. All correspondence between any member or official of the Government or any other person or persons, relating to the application of one John Lapointe of Spanish, for a renewal of his fishery license for the years 1911 and 1912. 2. Any reports or recommendations relating to the matter made by any official of the Game and Fisheries Department. Presented to the Legislature, 18th April, 1913. *Mr. Clarke. Not printed.*

No. 104 Return to an Order of the House of the 10th March, 1913, for a Return showing:—(*a*) Copies of all correspondence between any official of the Government and the Standard Insurance Company during the years 1907, 1908 and 1909. (*b*) A copy of any Reports made by the Inspector who inspected the books of the Standard Insurance Company during the same years. (*c*) Copies of all correspondence between any official of the Government and the Liquidator of the Standard Insurance Company. Presented to the Legislature, 18th April, 1913. *Mr. Elliott. Not printed.*

No. 105 Return to an Order of the House of the 19th February, 1913, for a Return showing:—1. All presentments made by Grand Juries within the Province of Ontario during the year ending 31st December, 1912, stating the assize at which each presentment was made and the date. Presented to the Legislature, 18th April, 1913. *Mr. Sinclair. Not printed.*

No. 106 Return to an Order of the House of the 26th February, 1913, for a Return showing:—1. The amount of money expended directly by the Government in each of the years 1911 and 1912, in the construction or repair of (*a*) roads: (*b*) bridges, and (*c*) drains in each of the Districts of Sudbury, Nipissing, Parry Sound and Sturgeon Falls, distinguishing the amount spent in each of said Districts for each of said purposes. 2. The amount of money expended during 1911 and 1912, by the Government by way of aid to any municipalities in the said Districts in the construction or repair of roads, bridges or drains, stating in respect to each work which was undertaken with Government aid as aforesaid. (*a*) The purpose of the work, that is, whether for roads, bridges or drains, and whether for construction or repair. (*b*) The District in which such work was undertaken. (*c*) The amount expended by the Government on such work. (*d*) The amount expended by the municipality on such work. Presented to the Legislature, 18th April, 1913. *Mr. Mageau. Not printed.*

No. 107 Return to an Order of the House of the 27th February, 1913, for a Return of:—1. Copies of all correspondence during the years 1910 and 1911 between the Minister of Lands, Forests and Mines, or any other member of the Government, and the Imperial Paper Mills Company, or the Liquidator or Interim Liquidator of the Imperial Paper Mills with reference to the diversion of water from Lake Temagimi into the Montreal River. 2. Copies of all correspondence passing during the years 1910 and 1911 between the Minister of Lands, Forests and Mines or any other member of the Government, and the Council of the Town of Sturgeon Falls, or any official or any other person on behalf of the Town of Sturgeon Falls, or the Board of Trade of the Town of Sturgeon Falls, or any person on behalf of the said Board of Trade. 3. How many cubic feet of water per second have been diverted from Lake Temagimi into the Montreal River, and what is the available head of water, and what is the horse power. Presented to the Legislature, 21st April, 1913. *Mr. Mageau. Not printed.*

No. 108 Statement of distribution of Revised and Sessional Statutes for the year 1912. *Not printed.*

No. 109 Return to an Order of the House of the 10th March, 1913, for a Return showing copies of the resolutions (if any) adopted at the Board Meeting held at the Horticultural Experiment Station at Jordan Harbour on or about December 17th last. Pre-

sented to the Legislature, 23rd April, 1913. *Mr. Anderson (Bruce.) Not printed.*

No. 110 Return to an Order of the House of the 27th March, 1913, for a Return showing:—1. Copy of an Order in Council dated the 23rd April, 1910, reducing the royalty payable to the T. & N. O. Railway by the Right of Way Mining Company. 2. Copy of an Order in Council dated 17th December, 1912, further reducing the royalty payable by the Right of Way Mining Company to the T. & N. O. Railway. 3. Copy of an Order in Council dated December 14th, 1909, reducing the royalty payable by the Cobalt Townsite Mining Company to the T. & N. O. Railway. 4. Copy of an Order in Council dated December 17th, 1912, further reducing the royalty payable by the Cobalt Townsite Mining Company to the T. & N. O. Railway. 5. Copy of an Order in Council dated December, 14th, 1909, reducing the royalty payable by the City of Cobalt Mining Company to the T. & N. O. Railway. 6. Copy of an Order in Council dated December 23rd, 1912, further reducing the royalty payable by the City of Cobalt Mining Company to the T. & N. O. Railway. 7. Copy of an Order in Council dated December 14th, 1909, reducing the royalty payable by the Nancy-Helen Mines, Limited, to the T. & N. O. Railway. 8. Copy of an Order in Council dated December 17th, 1912, further reducing the royalty payable by the Nancy-Helen Mines, Limited, to the T. & N. O. Railway. 9. Copy of an Order in Council dated December 14th, 1909, reducing the royalty payable by the Wright Silver Mining Co., to the T. & N. O. Railway. 10. Copy of an Order in Council dated December 17th, 1912, further reducing the royalty payable by the Wright Silver Mining Co., to the T. & N. O. Railway. 11. Copy of an Order in Council dated December 14th, 1909, reducing the royalty payable by the Railway Reserve Mines, Limited, Jack Pot Silver Mining Company, Ontario Development and Mining Company, and Station Grounds Mining Company, to the T. & N. O. Railway. 12. Copy of an Order in Council dated December 17th, 1912, further reducing the royalty payable by the Railway Reserve Mines, Limited, Jack Pot Silver Mining Co., Ontario Development and Mining Company and Station Grounds Mining Company, to the T. & N. O. Railway. 13. Copy of an Order in Council or agreement reducing the royalty payable by the O'Brien Mine to the Crown. 14. Copy of Order in Council or agreement, further reducing the royalty payable by the Chambers-Ferland Mining Company from 25 *per cent.* of value of ore at pit's mouth, less surface charges, to 25 *per cent.* of net profits. 15. Copy of agreement dated 8th October, 1912, exempting Chambers-Ferland Mining Company from royalty, unless on rich ore being found, when rate of 25 *per cent.* on net profits made to be imposed. Presented to the Legislature, 23rd April, 1913. *Mr. McDonald. Not printed.*

No. 111 Return to an Order of the House of the 26th February, 1913, for a Return shewing:—1. Copies of all correspondence and other papers, documents, etc., seized by the Crown in connection with the prosecution of the Canadian Washing Machine Manufacturing Association. 2. Copies of all correspondence between the Government or any member or official of the Government and any other person or persons relating to the Canadian Washing Machine Manufacturing Association, or the prosecution thereof, or the discontinuance of such prosecution. 3. Copies of all correspondence and other papers, documents, etc., seized by the Crown in connection with the prosecution of the Canadian Clothes Wringer Manufacturing Association. 4. Copies of all correspondence between the Government, or any member or official of the Government, and any other person or persons, relating to the Canadian Clothes Wringer Manufacturing Association, or the prosecution thereof, or the discontinuance of such prosecution. Presented to the Legislature, 23rd April, 1913. *Mr. Sinclair. Not printed.*

No. 112 Return to an Order of the House of the 14th March, 1913, for a Return showing:—For the year 1912. 1. The number of cases in which damage suits were entered in Court against the employer. 2. The number of instances where damages were obtained and the amounts. 3. The number of cases non-suited by the Court. 4. The number of cases where employers settled by paying compensation without damage suit and the amounts. Presented to the Legislature, 7th May, 1913. *Mr. McQueen. Not printed.*

No. 113 Return to an Order of the House of the 27th March, 1913, for a Return showing:—1. The names of the professors of the Faculty of Education (not including instructors in practice schools) at (*a*), Toronto University; (*b*), Queen's University. 2. The number of hours teaching done by each of said professors *per* week. 3. The number of students in attendance in the Faculty of Education during the Session 1912-1913, at (*a*), Toronto University; (*b*), Queen's University. 4.The average cost *per* pupil in the Faculty of Education during each of the last five years at (*a*), Toronto University; (*b*), Queen's University. 5. The number of extra-mural students under instruction by the Faculty of Education at (*a*), Toronto; (*b*), Queen's. 6. The number of hours of instruction *per* session given in each of the following subjects of the course of study in education:—(*a*) History of Education and Educational systems; (*b*) Principles of Education; (*c*) Psychology and General method; (*d*) School management and school law; (*e*) Methods in Public School subjects; (*f*) Methods in High School subjects; (*g*) Art work; (*h*) Commercial work and writing; (*i*) Constructive work; (*j*) Household science; (*k*) Nature study; (*l*) Music; (*m*) Physical training; (*n*) Physiology and Hygiene, including treatment of emergencies. Presented to the Legislature, 7th May, 1913. *Mr. Marshall.* ***Not printed.***

Macadamized Road, Winchester, Ontario.
Village Street, in Residential Section, with concrete curbs.

Macadamized Road, Winchester, Ontario.
From the Village to the Railway Station.

ANNUAL REPORT

ON

Highway Improvement

ONTARIO

1913

PRINTED BY ORDER OF

THE LEGISLATIVE ASSEMBLY OF ONTARIO

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CONTENTS

PAGE

Letters of Transmission 6, 7
Report 9

Expenditure by Counties 10
Model and Experimental Roads 11
Winchester Road 11
Windsor Macadam Road 12
Concrete Section of Tecumseh Road 13

Road Models 13
Modern Macadam Road 14
Bituminous Macadam Road 15
Construction of Township Roads 16
Resurfacing Old Roads 17
The Log Drag on Earth Roads 18
Concrete Road—One Course 19
Residential Streets 20
Bituminous Pavement on a Town Street 21
Vitrified Brick Pavement 22
Road as Built by Macadam in 1800 23
Telford Road 24
Early French Road 25
Roman Road 26
The Appian Way 27

Road Machinery 28
Grading Machines 29
Steam Rollers 29
Stone Crushers 30
Traction Engines 30
Miscellaneous Equipment 31
The Log Drag 32

Specifications for Road Machinery 35
Steam Roller 36
Stone Crusher 36
Rock Drill 37
Spreading Wagons 37
Sprinkling Wagons 37

Concrete Roads and Pavements in Ontario 38
Typical Pavements 38
Use of Hydrated Lime 39
A Rich One-Course Mixture 40

Specification for Concrete Roadway 42
Township Road Management 48
Townships in which Statute Labour is Commuted or Abolished 50
Model By-law for Townships 54

Index 57

To His Honour Sir John Morison Gibson, Knight Commander of the Most Distinguished Order of St. Michael and St. George, a Colonel in the Militia of Canada, etc.

Lieutenant-Governor of the Province of Ontario.

May it Please Your Honour:

I herewith beg to present for your consideration the annual report of W. A. McLean, Commissioner of Highways, relating to Highway Improvement in the Province of Ontario.

Respectfully submitted,

J. O. Reaume,

Minister of Public Works.

To the Honourable J. O. Reaume,

Minister of Public Works.

Sir,—I have the honour to transmit to you the annual report on Road and Bridge construction in Ontario, having special reference to the work carried on by the several counties of the Province during the year 1912 under the Act to Aid in the improvement of Public Highways.

I have the honour to be,

Sir,

Your obedient servant,

W. A. McLean.

Commissioner of Highways.

Parliament Buildings, Toronto.
April 17th, 1913.

ANNUAL REPORT

ON

HIGHWAY IMPROVEMENT

By W. A. McLean, M. Can. Soc. C.E., Commissioner of Highways.

The Highway Improvement Act was, during 1912, participated in by twenty counties. With these the Office of Public Highways exercised the usual co-operation. Engineering advice and assistance were given, plans and contracts, specifications considered, the work of the year was inspected, and Provincial grants of one-third the expenditure on construction were paid in each case. Literature respecting roadmaking was published and distributed, and special attention given to townships which have established, or which were considering, more efficient methods of work or organization. Plans and specifications of county bridges were examined and revised where necessary to comply with the standard specification of this office. Public meetings and county councils in session were addressed in the interest of roadmaking and more effective organization.

The counties participating under the Highway Act were: Carleton, Frontenac, Halton, Hastings, Lanark, Wellington, Leeds and Grenville, Lennox and Addington, Lincoln, Middlesex, Oxford, Wentworth, Peel, Perth, Prince Edward, Simcoe, Waterloo, York and Welland. Much interest has been shown by a number of counties in which the creation of county systems has been considered, more especially, Dundas, Stormont and Glengarry, Norfolk, Huron, Essex and Lambton.

The total expenditure on County Roads for the year 1912 under the Highway Improvement Act has been as follows:

Road construction	$567,948 71
Permanent bridges	190,617 52
Superintendence	31,200 97
Machinery, plant, and equipment	94,073 19
Special county grants to townships, towns and villages	14,790 79
Total	$898,631 18
Provincial grants, one third	$299,543 69
County expenditure, two thirds	$599,087 49
Total	$898,631 18
Roads, graded, drained and surfaced with crushed stone	138.6 miles.
Roads graded, drained and surfaced with gravel	66.5 miles.
Total mileage metalled	205.1

The work and expenditure included in addition 88 miles of grading; the construction of 424 tile culverts, 96 concrete or other permanent culverts under ten feet span; and 114 bridges of more than ten feet span.

All county bridges are of steel or concrete built to comply with standard specifications of the Provincial Engineer of Highways and issued in accordance with the Municipal Act, 3-4 Geo. V., chapter 43, section 459. Small waterways are usually of concrete or corrugated iron with concrete head-walls. Larger culverts are more commonly reinforced concrete arches, or flat-top structures; while long spans consist of steel superstructure with concrete abutments, piers and wing-walls.

Expenditure by Counties

The following schedule shows the total expenditure by counties for the year 1912.

	County.	Year of commencement under the act.	Total length of county system in miles.	Total expenditure.	Government grant	Raised by county.	County method of providing funds for construction.
				$	$	$	
1	Wentworth	1902	140	13,420 42	4,473 47	8,946 95	Annual levy and small debenture debt.
2	Lanark	1903	98	4,404 82	1,468 27	2,936 55	Debenture debt.
3	Simcoe	1903	427	19,176 25	6,392 08	12,784 17	Annual levy.
4	Wellington	1903	170	31,231 09	10,410 36	20,820 73	Annual levy.
5	Lincoln	1904	36	14,312 91	4,770 97	9,541 94	Annual levy and small debenture debt.
6	Oxford	1904–7	256	17,312 14	5,770 71	11,541 43	Debenture debt.
7	Hastings	1904	472	50,638 39	16,879 46	33,758 93	Annual levy with debentures for bridges.
8	Peel	1906	102	23,073 01	7,691 00	15,382 01	Debenture debt.
9	Middlesex	1906	220	71,433 89	23,811 29	47,622 60	Annual levy.
10	Lennox and Addington	1906	169½	17,273 43	5,757 81	11,515 62	Annual levy.
11	Prince Edward	1907	122	53,553 92	17,851 31	35,702 61	Debenture debt.
12	Halton	1907	189	65,409 19	28,469 73	36,939 46	Debenture debt.
13	Perth	1907	210	21,115 21	7,038 40	14,076 81	Annual levy.
14	Frontenac	1907	127	16,451 78	5,483 93	10,967 75	Annual levy.
15	Waterloo	1908	175	20,107 69	6,702 56	13,405 13	Annual levy.
16	Carleton	1909	220	43,202 93	14,400 98	28,801 95	Debenture debt.
17	Leeds and Grenville	1910	247	67,680 58	22,560 19	45,120 39	Debenture debt.
18	York	1911	114	251,780 76	83,926 92	167,853 84	Debenture debt.
19	Haldimand	1911	125	32,953 06	10,984 35	21,968 71	Debenture debt.
20	Welland	1912	153	44,099 71	14,699 90	29,399 81	Debenture debt.
	Totals	.....	3,772½	898,631 18	299,543 69	599,087 49	

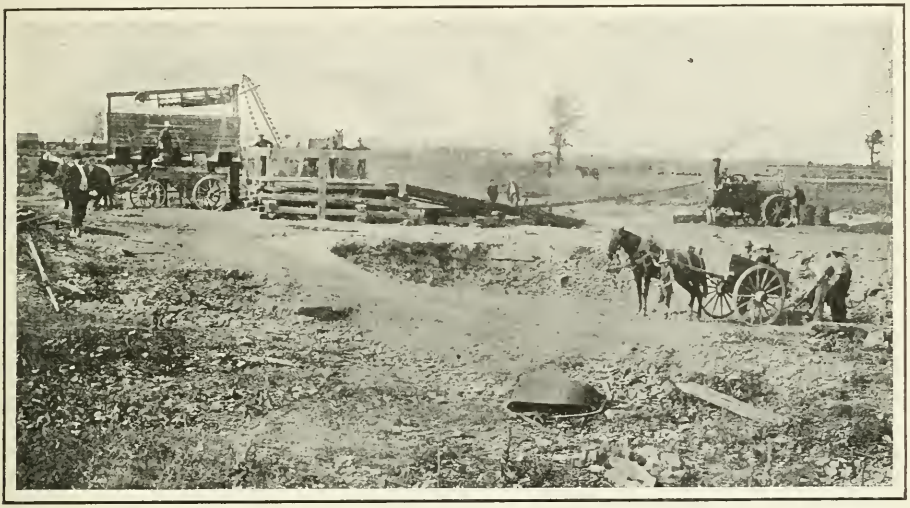
MODEL AND EXPERIMENTAL ROADS.

Model and experimental road construction was provided for by an amendment to the Highway Improvement Act in 1912. This class of work has been undertaken in several of the States and by the U. S. Office of Public Roads at Washington.

The existing State Highway System of Massachusetts had its origin in a similar arrangement for model road construction; and as the mileage was extended, and municipalities failing to understand or undertake proper maintenance, the roads were assumed by the State.

Experimental work is uncertain in results and is, therefore, not a matter in which local municipalities should be expected to venture, but is rather a proper field for central administration, through which all municipalities can profit without undue risk.

Model roads have been productive of good results, but, requiring a new organization of men and teamsters for each short section of work, are necessarily more expensive than similar construction as part of a lengthy system of roads. Other



Stone Quarrying and Crushing, Winchester, Ontario.

factors, such as location and purchase of supplies for a small work, also tend to add to their cost. A detached section of good road beginning and ending in mud is of little service, and as macadam and gravel roads are greatly injured by mud dropped from wheels, it is usually desirable to accept as a location for such roads the extension of village, town, or city streets. In such a position they receive more travel, are seen by more people, and are therefore more educative, but demand a better and more costly type of construction than in localities of less traffic.

Winchester.

The Winchester model road extends from the centre of the village to the railway station, a total distance of 1.2 miles. Of this, about 1,022 feet was past village property, where the opportunity presented itself to construct a suitable type of macadamized village street with concrete curbing. The remaining 5,274 feet passes agricultural property. A large traffic passes over this road, not only from the village, but from the adjacent townships, and the situation is one to reach and influence a considerable area.

Limestone was used from a quarry opened for the work about one-third of a mile from the southern end of the road. This material, while not of the best, is no doubt economical for the locality, but should receive constant attention for maintenance. The general depth of stone provided by the specifications is ten inches; one block is 34½ feet in width between curbs; two blocks are 25 feet between curbs; while on the remainder of the road the stone is 16 feet in width, and the grade 26 feet between shoulders.

The road before improvement was very similar to many old, poorly built, and neglected highways in the Province. It had previously been gravelled, but that material had been applied without rolling; the road was flat, badly drained, and in spring and fall almost impassable. In reconstructing it, suitable tile under-drainage was provided, six tile culverts were laid; also one concrete culvert of 8 feet span, walls 5.5 feet in height, built on a skew 26 feet long, and 24 feet clear width of roadway. Owing to the wet season of 1912 the progress of the work was delayed.

The unit cost was nearly 86 cents per square yard, made up as follows:

Tile under drainage and culverts	$ .09
Grading and earthwork	.047
Stripping quarry and making service road	.028
Quarrying, crushing and delivering stone, 5,090 c.y. at 1.42	.594
Rolling and finishing	.083
Plans and surveys	.012
Repair to plant and equipment	.004.
Total, per square yard	$ .859

Windsor Macadam Road.

Two short sections of road were built adjacent to Windsor, one of water-bound macadam, the other of concrete, for experimental as well as an educational purpose. To this work the city of Windsor contributed $2,000, and the Township of Sandwich West $500, or $2,500 in all.

The macadamized road is 3,900 feet in length. The road prior to construction was rough, without metal, without drainage, and a portion was flooded during spring freshets. Considerable earthwork was required to raise the lowest portions and produce an even grade. The road as constructed is 26 feet between gutters, with stone 18 feet in width and ten inches in depth. Lime stone was used for the greater part of the work. The traffic on this road is heavy, to the M.C.R.R. station, and from a considerable area to the south, forming one of the main entrances to the city for rural traffic. The unit costs per square yard of stone, exclusive of grading and entrances to adjacent property, were as follows:

Stone (3,500 tons 2 inch stone, 630 tons screenings)	$ .653
Labour, teams, etc., macadamizing	.320
Roller and Operator	.014
Coal	.014
Tile underdrainage	.014
Surveys and plans	.005
Small tools and sundries	.003
Cost per square yard	$1.023

Concrete Roadway.

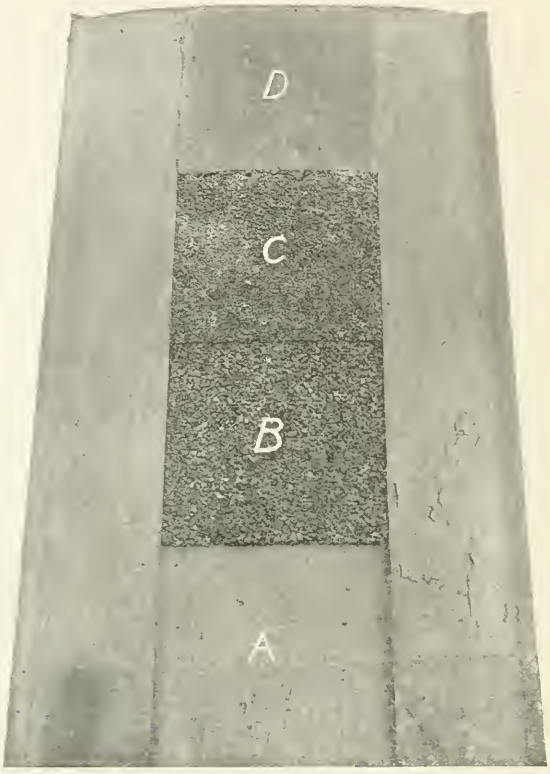
The concrete section is 3,166 feet in length, on Tecumseh Road, the boundary line between the Township of Sandwich and Windsor. It extends past the fair grounds, where there is an exceptional opportunity for observation. It is also the westerly terminus of the main trunk road of the Province, the road from Windsor to Montreal, and known in its various sections as the Longwoods Road, Governors Road, Dundas Street, Kingston Road, etc. The concrete is 16 feet wide and 7 inches thick, with broken stone shoulders 18 inches wide on each side. One section, for experimental purposes, contains 8 per cent. of hydrated lime; another is of washed river gravel, and another of clean pit gravel. The mixture is one part of cement to four parts of gravel, laid in one course. Specifications are to be found elsewhere in this report. The unit cost of the concrete, exclusive of tile drainage and stone sides, was $1.366 per square yards, as follows:

Labour on concrete	$ .521
Rent of two mixers (and operators)	.079
Cement, 1,635 bbls.	.398
Hydrated lime	.016
Gravel, 1,470 c.y.	.225
Lumber for forms	.027
Joints, steel and filler	.027
Blacksmithing	.020
Water-pipe rental	.008
Sundries	.015
Cash per square yard	$1.336

ROAD MODELS.

A series of road models has been prepared for exhibition purposes, as a means of showing the various processes of roadmaking, ancient and modern. Of historical forms are the Appian Way, an early Roman Colonial road, the early types of Macadam, Telford, and Trésaguet. Modern roadmaking is illustrated by a model showing the use of the log drag, construction of a bitulithic pavement, a concrete road, a brick road, a modern macadam road, the re-surfacing of old roads, the cheap construction of township roads, and town street improvement. These models are each four feet long and two feet wide, fourteen in number, and are available for fall fair and other exhibition purposes.

Descriptive cards and photographs accompany these models. These descriptions of the various stages are as follows:



Modern Macadam Road.

Modern road construction has been much influenced by the invention of such machinery as road graders, stone crushers and steam rollers, all of which were unknown to Macadam, Telford, or Trésaguet, and the earlier road builders. The model shows a broken stone road of the more expensive type, with a graded width of 28 feet, width of stone 16 feet, depth of stone 6 inches consolidated, and the crown of 5/8 inch to the foot. It is composed as follows:

(*a*) A prepared and excavated earth sub-grade.

(*b*) A first layer of coarse stone.

(*c*) A second course of stone screened to a uniform size.

(*d*) A binder course using stone screenings, *i.e.*, stone chips and dust.

Each of the foregoing courses should be consolidated with a steam roller. The final course should be well sprinkled from a watering cart and the road rolled until thoroughly consolidated.

Bituminous Macadam Road.

The necessity for this type of road has grown up in response to modern motor traffic, producing a dustless surface, and one which resists the wear of self-propelled vehicles. The model shows the broken stone 16 feet wide and 6 inches in consolidated depth, which has been bound and made waterproof by the use of tar or asphalt. The camber on this type of road may be reduced to about ½ inch to the foot. The type of road shown by the model is composed as follows:—

(*a*) Prepared earth sub-grade, consolidated by rolling.

(*b*) First course (4 inches consolidated). Unless the sub-soil is a dry gravel or strongly supporting sand, a previous foundation course is generally necessary.

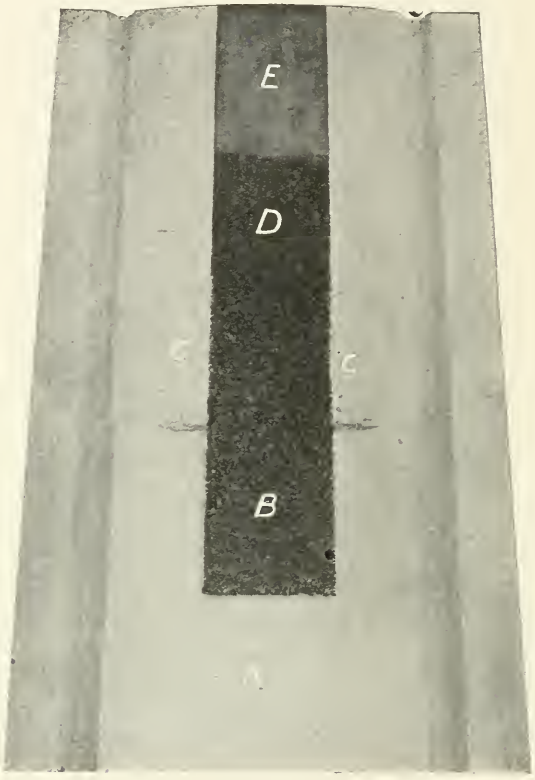
(*c*) Application of Bitumen (1½ gallons per square yard) by the "penetration" method, the tar or asphalt being poured hot over the stone and penetrating the top two inches.

(*d*) Second course (2 inches consolidated).

(*e*) Stone chips applied and rolled.

(*f*) Bitumen paint coat (½ gallon of tar or asphalt per square yard).

(*g*) Completed surface, clean stone chips rolled.



Construction of Township Roads.

The methods here shown are applicable when a road is being built on new ground, or over an old earth road, and is a cheap process of construction for light traffic.

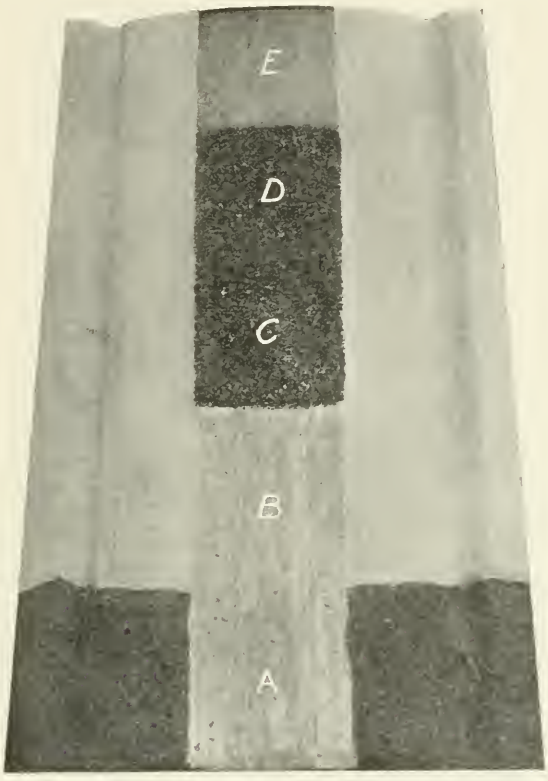
(*a*) Well drained and graded earth base consolidated with a roller.

(*b*) Crushed stone spread in centre of grade.

(*c*) Earth drawn from the side with grader, forming a support for the stone and also giving shoulders the necessary fall to the ditches.

(*d*) Stone and earth shoulder rolled at one operation.

(*e*) Binder course, flushed and rolled, giving finished surface.



Resurfacing Old Roads.

Many gravel and stone roads, at one time well-built, have been neglected and allowed to become flat and rutted. Earth shoulders have developed, often higher than the centre of the road. In restoring these roads the earth shoulders should be thrown outwards, across the ditch if necessary; not used to cover the old stone or gravel foundation. The model shows the following stages:

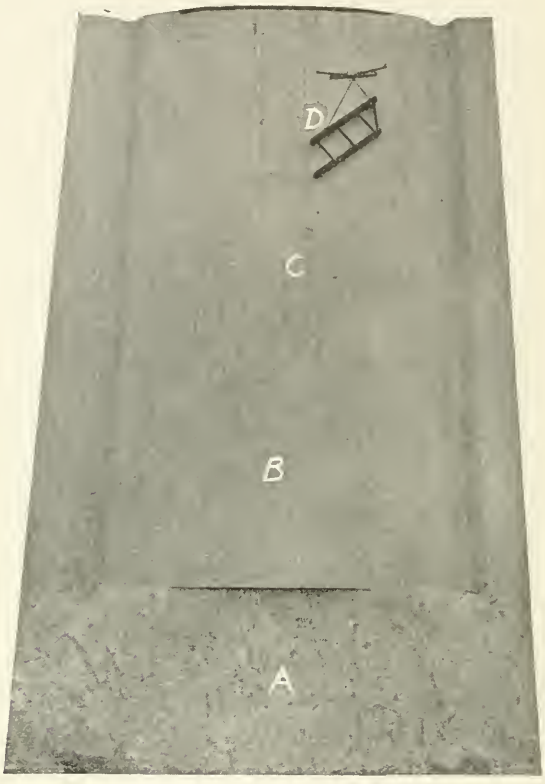
(*a*) Old road with sod shoulders higher than the centre, affording no drainage.

(*b*) Old road with shoulders well graded, and side-ditches cleaned (in itself a great improvement).

(*c*) Broken stone spread to give a consolidated thickness of six inches.

(*d*) New stone partly consolidated with roller.

(*e*) Binder course of stone screenings flushed with water and finished with a steam roller.



The Log Drag on Earth Roads.

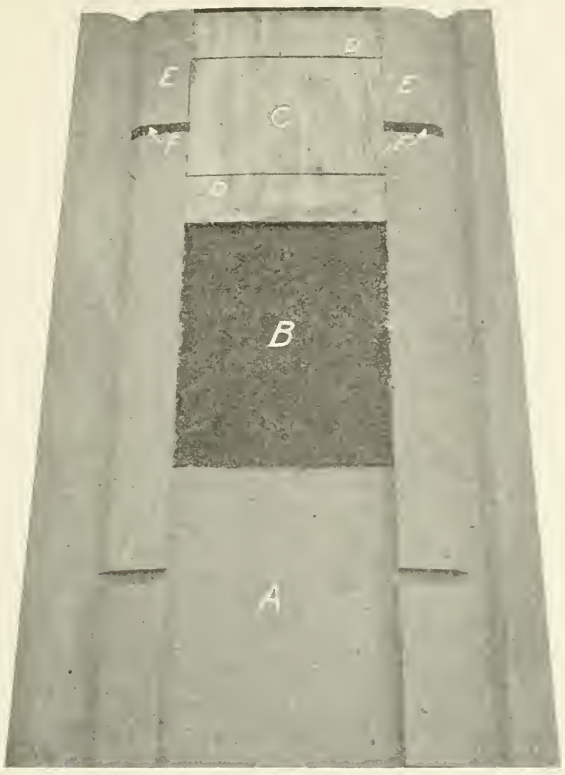
By the systematic use of this simple tool, it is possible to keep earth roads, the greater mileage of township roads, in their best possible condition. The grading machine should be used to construct. The log drag can then be used to maintain permanently. The cost is insignificant when compared with the benefits derived. The model indicates the process:

(*a*) Common earth road, flat and rough.

(*b*) Road graded and crowned by use of a grading machine, and side ditches opened.

(*c*) Road after traffic has worn shallow ruts.

(*d*) Log drag filling ruts and smoothing shoulders after a rain.



Concrete Road—One Course.

Concrete is coming into use as a pavement for main roads. When properly constructed concrete gives a superior surface as regards ease of traction, dustlessness, sanitary qualities and durability.

In order that a concrete road may be successful certain details should be observed: The stone or gravel should be hard and tough; gravel, if used, should be absolutely clean; the sand and stone must form a dense mixture; the mixture must be rich in cement; the bottom of the concrete should be flat; a one-course pavement is desirable.

The process indicated by the model is as follows:

(*a*) Prepared earth sub-grade, compacted with a steam roller.

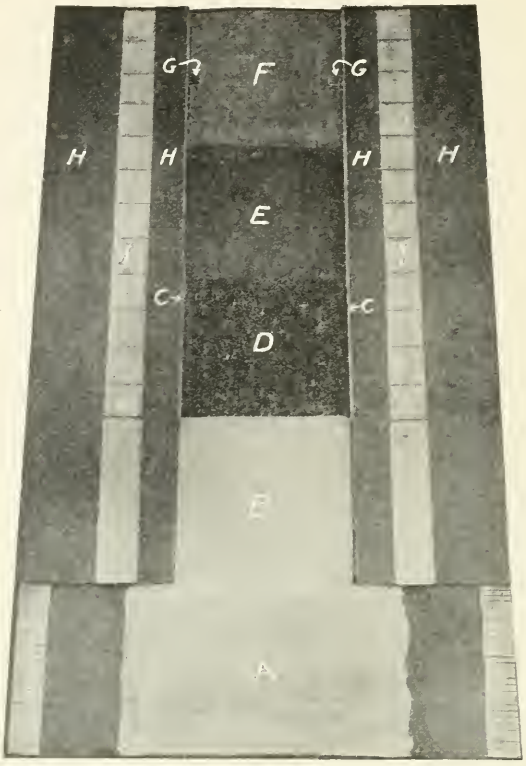
(*b*) Gravel, rolled, 4 inches deep.

(*c*) Concrete, 6 to 7 inches thick, placed in a single course.

(*d*) Temperature joint ¼ inch wide filled with tar asphalt or tar paper.

(*e*) Earth or gravel shoulder.

(*f*) Drain from sub-grade to side ditch.



Residential Streets.

The appearance of residential streets in towns and villages may be improved by well-built roadways and well-kept boulevards. Features of the model are as follows:

(*a*) Common condition of streets in towns and villages before improvement, with roadway wider than necessary.

(*b*) Earth sub-grade excavated and rolled, surplus earth being used to fill and level the sides.

(*c*) Concrete curb.

(*d*) Crushed stone laid to a thickness, when consolidated, of at least six inches. A previous foundation should be laid unless the sub-soil is strongly supporting gravel or coarse sand.

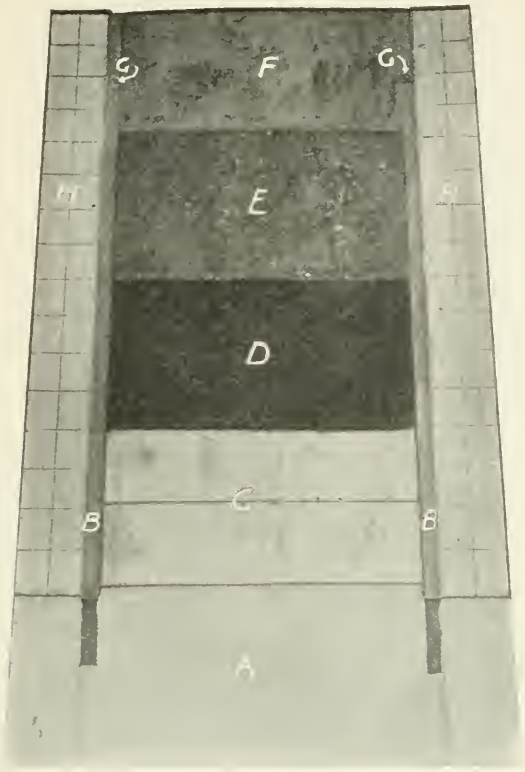
(*e*) Same course after rolling.

(*f*) Finished roadway, showing binder course watered and rolled.

(*g*) Catch-basin for removal of surface water in tile under-drains.

(*h*) Boulevard, graded and sodded.

(*i*) Concrete sidewalk.



Bituminous Pavement on a Town Street.

This type of pavement is durable, sanitary, easily cleaned and repaired, offers low resistance to traction, is dustless and comparatively noiseless. The process of construction as shown by the model is as follows:

(*a*) Earth sub-grade, compacted with steam roller.

(*b*) Concrete curb and gutter.

(*c*) Concrete base six inches thick.

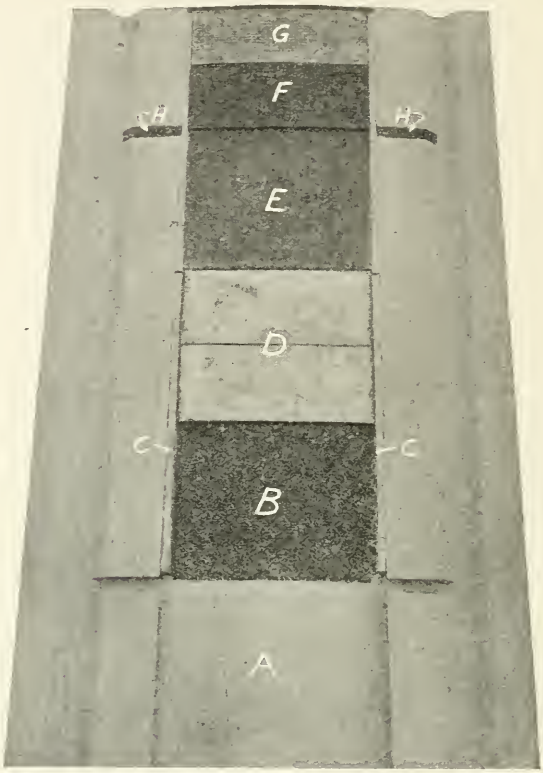
(*d*) Mixture of stone and bitumen 2½ inches thick, consolidated with a roller.

(*e*) Bituminous binder coat, rendering surface smooth and waterproof.

(*f*) Stone chips sprinkled over surface to absorb excess of bitumen, and then rolled.

(*g*) Catch basin to take off surface water.

(*h*) Concrete sidewalk.



Vitrified Brick Pavement.

Vitrified paving brick is suitable where traffic is heavy, and for business sections of towns and cities. Brick country roads have also been built in some localities of the United States, particularly in Ohio, where paving brick is largely manufactured. The model shows a road of the latter class.

(*a*) Prepared earth sub-grade which has been consolidated with a steam roller.

(*b*) A 4-inch layer of gravel, also rolled.

(*c*) Concrete curb.

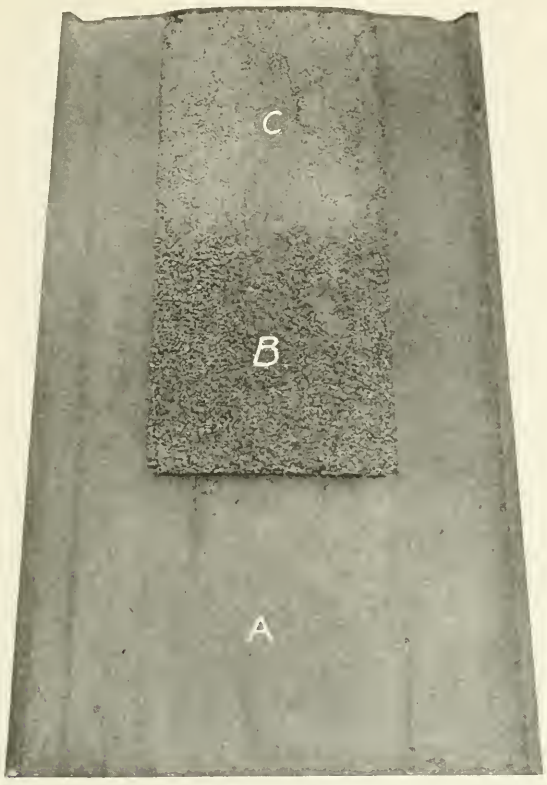
(*d*) Concrete base.

(*e*) Sand cushion two inches thick.

(*f*) Bricks laid on edge and tamped to a solid bearing.

(*g*) Finished pavement, showing joints filled with Portland cement grout.

(*h*) Drain from sub-grade to side ditch.



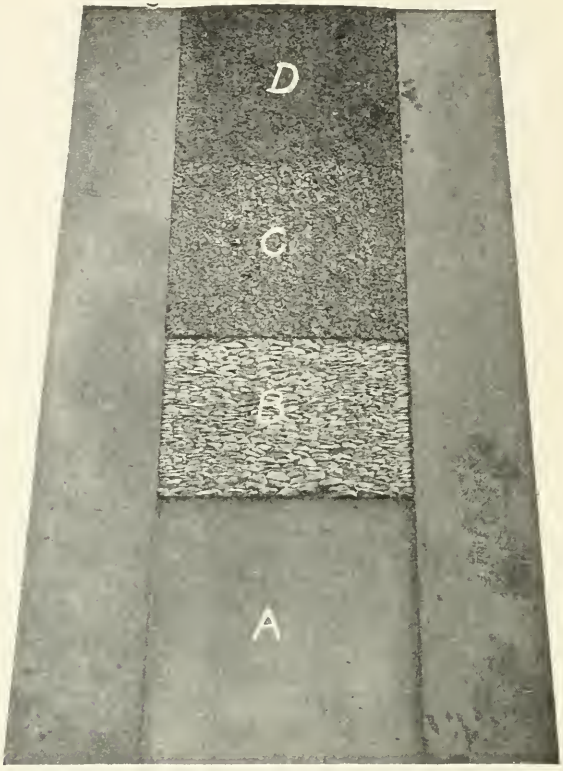
Road as Built by Macadam in 1800.

The road systems of England, France and other European countries, contrary to common belief, have been created within a little more than a century. The model illustrates the earlier type of road introduced by Macadam, by whom the principles of modern road construction were for the first time clearly established. The macadam road was composed as follows:—

(*a*) An earth foundation with crown or camber, which was always made higher than the surface of the adjacent ground so as to facilitate the escape of water from foundation and surface. Macadam did not believe in an excavated foundation.

(*b*) Hand-broken stone, depth 10 inches, size of stone 6 ounces in weight, and no stone to exceed 1½ inches in greatest diameter. The surface was raked regularly during the process of consolidation. Rollers were not used then, and the stone was compacted by traffic.

(*c*) Finished road, 16 to 18 feet wide; crown just enough to shed water—4 to 6 inches. MacAdam believed that the stones would lock or bond by virtue of their angularity, making a watertight crust, and that it was neither necessary or desirable to "bond a road with earth, clay, or other material that would imbibe water or be affected by frost." The surface of the road was kept even and smooth by the addition of fresh material where necessary. This material was placed on the road in thin layers in damp weather in order that the new material might more readily bond and incorporate with the old.



Telford Road.

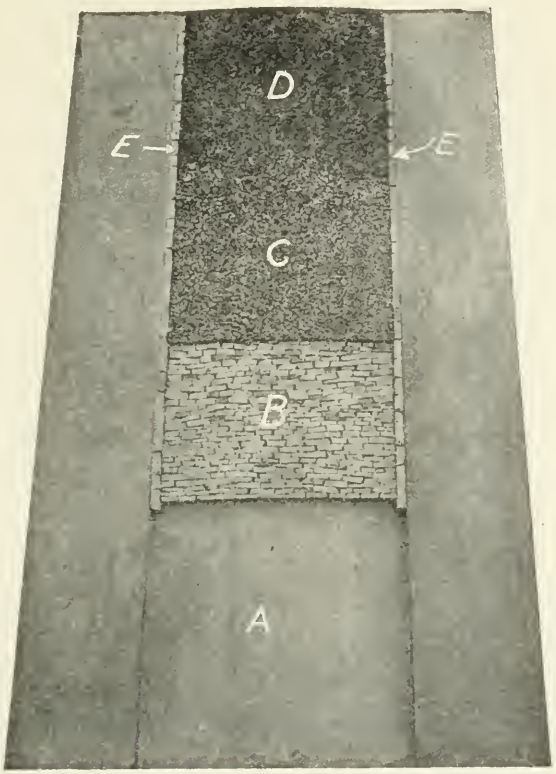
The system of road construction as used in England by Telford during the period beginning about 1820 was somewhat similar to the method of M. Trésaguet in France. The chief distinction was that the earth sub-grade of Trésaguet was cambered, and the foundation stones were of uniform depth. Telford made a flat sub-grade, but used small stones at the side and larger stones in the centre to provide the necessary camber. Telford's method, as shown by the model, was as follows:—

(*a*) An excavated earth sub-grade 16 to 20 feet wide: flat.

(*b*) Telford base composed of stones about 7 inches in depth, set on edge by hand, with broadest base down and every other course breaking joints; no stone more than three inches wide at the top. Interstices were carefully filled with smaller stones and spauls wedged into position, and all uneven projections were broken off.

(*c*) Top course about seven inches thick at crown, composed of hand broken stone, none of which exceed six ounces in weight; stone so broken as to pass through a circular ring not larger than 2½ inches in diameter.

(*d*) Finished road bonded with one inch of gravel; crown six inches for road surfaced to a width of 18 feet.



Early French Road.

Road-building in Europe ceased with the fall of the Roman Empire, and was neglected until the latter part of the eighteenth century. This model illustrates the first step in modern road construction as revived under M. Trésaguet during the period from 1775 to 1830. After 1830 the Macadam method was used almost exclusively. The plan of Trésaguet comprised the following:—

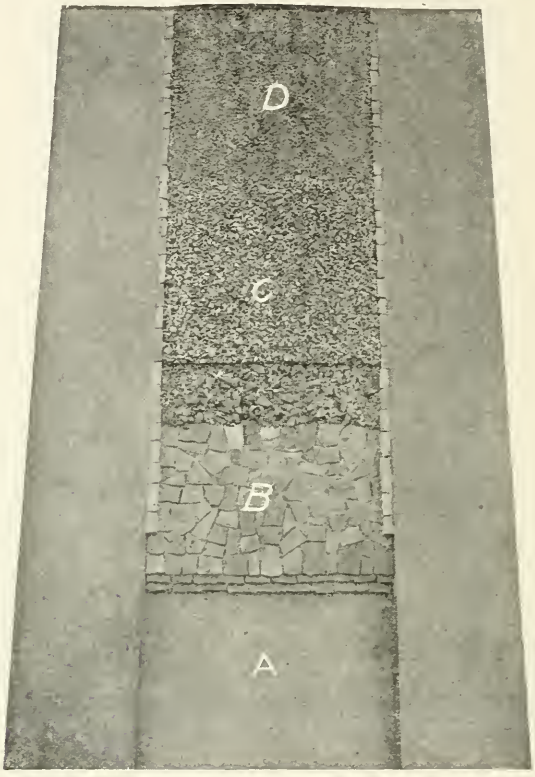
(*a*) An excavated earth sub-grade made parallel to the finished surface.

(*b*) A stone foundation laid by hand composed of flat stone placed on edge lengthwise across the road, and rammed to an equal surface; depth about five inches.

(*c*) Small stone, laid and broken with hand hammers; the top layer was composed of broken stone about the size of walnuts and spread with a shovel.

(*d*) The finished road, consolidated by travel; crown six inches, width 18 feet, total thickness about 10 inches.

(*e*) Curbs composed of rough, flat stones set on edge; the upper edge flush with the surface.



Roman Road.

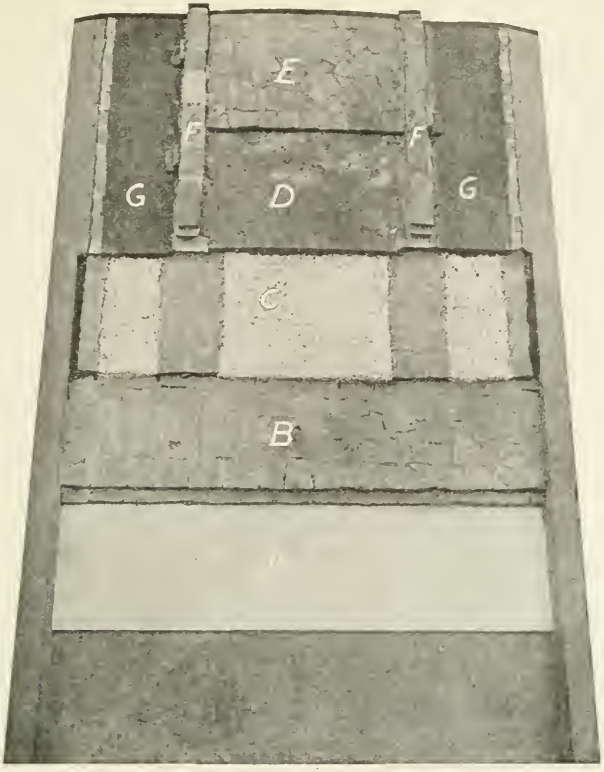
This model illustrates a type of road constructed by the Ancient Romans in Europe at a period of which it was said "All roads lead to Rome." Substantial remains still exist in England, France and other countries. It was composed as follows:—

(*a*) An excavated earth sub-grade, with flat surface.

(*b*) Stone foundation, composed of flat stones laid by hand in two or more layers; total width of foundation about 18 feet, depth 9 to 10 inches.

(*c*) Small stones spread and broken in place with hand hammers.

(*d*) Finished surface composed of thin layers of stones broken by hand smaller than the underlying material, consolidated by traffic; total thickness in centre 18 to 20 inches and 12 to 14 inches at the sides.



The Appian Way.

Twenty to thirty feet wide and three feet thick.

This famous road was built about 300 B.C. by Appius Claudius Caecus, from Rome to Capua, and was later extended to Brindisi, a total distance of 360 miles. The following are the several layers of which it was composed:—

(*a*) "Contignata Pavimenta," composed of lime, and sand or straw, rushes or reeds, sometimes laid on oak sills or boards called "esculus."

(*b*) "Statumen," or foundation, composed of two courses of flat stones laid dry or in lime mortar; depth 16 to 18 inches.

(*c*) "Rudus," or rubble, composed of broken stone mixed with lime, 1 part lime to 3 parts stone. When the material came from old buildings, it was called "Rudus redivivum"; depth 6 to 9 inches.

(*d*) "Nucleus," composed of coarse gravel and lime used hot, or bricks, potsherds, or broken tile, mixed with lime and covered with thin layer of lime mortar.

(*e*) "Summa Crusta" or "Pavimentum," consisting of polygonal blocks joined with greatest nicety; depth about 6 inches, width about 16 feet.

(*f*) Curbs, 2 feet wide and 18 inches high, with upping blocks, which served as seats for travelers and mounting blocks for cavalry.

(*g*) Side road, surface composed of gravel flushed with mortar; width 6 to 8 feet.

ROAD MACHINERY.

Roadmaking has, of recent years, been greatly influenced by the introduction of labour-saving machinery. The materials of roadmaking are comparatively few, and apart from the common earth road include principally gravel, sand, broken stone, asphalt, tar, vitrified brick, creosoted wood, stone setts, oils, and Portland cement, in varying forms and combinations. Other materials may be discovered, but there are indications that important advances may rather be expected through improved machinery, to more cheaply and effectively use the materials already employed.

The cost of road building is made up principally of the cost of labour. Expenditure for materials in their natural state, and for equipment, is comparatively small. Gravel in the pit, stone in the quarry cost very little. The chief outlay is for excavating gravel and hauling it to the roads; for quarrying the stone, crushing it, teaming to the road, spreading and rolling to place. Grading, ditching and draining are all matters of labour. For this reason, the use of labour saving implements becomes especially necessary.

The present age is distinguished as an age of machinery, and the tendencies which are at work to displace the manual by the mechanical in manufacture and production, and in all other fields of construction, are evident in respect to roadmaking.

The purchase of roadmaking equipment, crushers, rollers, engine and wagons costs a considerable sum, but when distributed over a series of years and the total length of road on which they are used, the cost of equipment per mile is comparatively little as compared with the cost of operation, teaming and manual labour involved in the construction of a road.

Roadmaking equipment and appliances have been steadily growing in number and improving in efficiency. With the increasing cost of manual labour, and its decreasing efficiency, there has been a growing advantage in the employment of machinery. Ten years ago, in the townships of Ontario men could be had for $1.25 a day, and teams for $3.00 or $3.50. Last season the ordinary price was $2.00 or $2.50 a day for men and $5.00 a day for teams. In individual cases wages were higher. Complaint is general that with the higher cost of labour, there is a tendency for men to do less work, all accruing to the advantage of using labour-saving equipment.

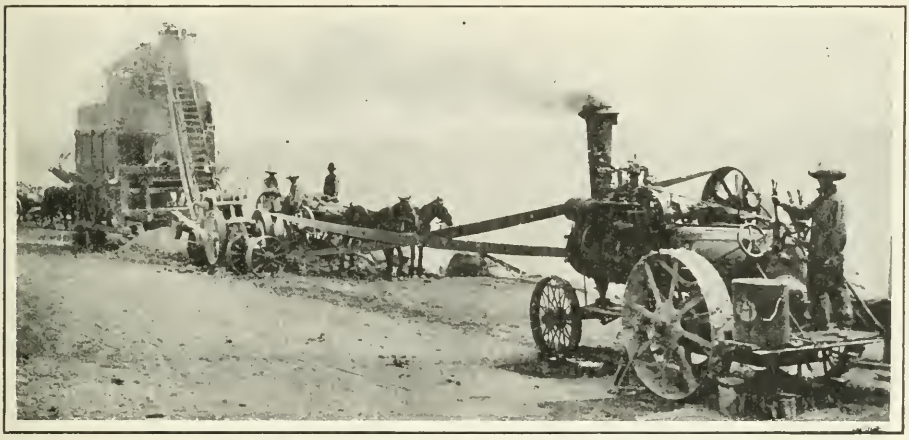
In order that machinery may be used to best advantage, it should be kept constantly employed, and on long stretches of work. If left idle for a considerable portion of the year, interest on the investment, and depreciation of value are an offset to the economy of its use. If used on short stretches only, the cost of moving from place to place, and the consequent delay and disorganization are a detriment. With the growing need for good roads, their construction must be taken out of the stage of patchwork, and made "a man's job."

The supervision and direction of roadmaking, involving the use of a considerable amount of machinery, is thus demanding a large amount of mechanical ability. Road superintendents and foremen who do not understand machinery and mechanical principles are not likely to achieve the highest success, and will work under a disadvantage. A practical knowledge of machinery, and skill in its operation, are becoming necessary qualifications for road management. With the lessening need for manual labour there is a corresponding demand for machinery operators.

The machinery required in any locality for roadmaking will depend principally on local conditions, and circumstances under which the work is being done. The list of machines and tools is a lengthy one, but as a rule only a few of these will be needed under any definite set of conditions or for a given work. In some districts, stone can be quarried and crushed in the immediate locality of the road; in other cases, it will be shipped in by rail; in some cases gravel is used; a bituminous concrete, or other form of road will require special types of implements.

Grading Machines.

Road graders are among the oldest and most generally used of road machines. Nearly every township in Ontario has at least one; some have as many as four. Their use is least in districts where rock comes to the surface, and the land is rough and broken; and they are of greatest value in purely agricultural districts, working constantly in uniform clay, loam and sandy soils.



Stone Crushing Plant, on Lennox and Addington County Roads.

The present tendency is toward the use of heavier grading machines; and drawn by steam tractors where the work can be performed in long stretches. The value of grading machines depends largely on the skill of the operators. An experienced man can do better work and at much less cost than one who is inexperienced. And in the hands of men who do not understand the principles of road-building, a vast amount of injury has been done by the misuse of these machines—particularly in cases where long stretches of old gravel roads have been covered with sand and earth drawn in from the shoulders. These old neglected gravel and stone roads should be restored by throwing the earth shoulders away from the gravel, using the grader to deepen the gutter or drain. Earth and sods on top of gravel and stone merely turn to dust and mud, and ruin the stone foundation.

Steam Rollers.

Steam rollers are a necessity wherever broken stone roads are being built. To leave stone in long loose stretches on the roadway is an obstruction to traffic, a practice that is wasteful, and one which cannot produce a good macadam road. A steam roller will save its cost in the saving of stone, in the greater durability of

the road, while the users of the road will find it a pleasure instead of a hardship to drive on it. When first built the road is at its best instead of at its worst. Ten ton rollers are best for ordinary country use. Heavier rollers are an additional strain on weak bridges, and are less easily handled on soft roads, especially in rolling the earth sub-grade. Horse rollers are very little used. Gasoline rollers have recently been introduced, but the difficulty of securing competent operators, and the increasing price of gasoline, have been obstacles to their use.

The ability of the roller operator will influence greatly the cost and quality of the road. An expert can so compact the sub-grade, and consolidate the stone, as to use a minimum amount of the latter material, and the completed road will be true to form, with a uniform crown and shape. An inexperienced man, or one who is careless, can drive into the mud uselessly, a large amount of broken stone, and can leave a very inferior surface, uneven and lacking in uniformity.

Stone Crushers.

Rock crushers are of two main types, the gyratory crusher and the jaw crusher. Gyratory crushers are most suitable for stationary work in a permanent quarry, but are not fitted for temporary road work, where a portable machine is desired to move from place to place. Jaw crushers are of two kinds, those of the camshaft and roller type, and those of the Blake pattern. The Blake machines have the advantage of greater simplicity, while the camshaft and roller design gives greater crushing capacity in proportion to weight.

Stone crushers of a portable type for general use in a municipality should have a capacity of at least 100 cubic yards of 2½ inch stone a day. Smaller crushers are, for ordinary road construction rarely found satisfactory, as they delay too much the season's work of road-building, and the cost of operating a small crusher is nearly as great as of operating the larger size. In carrying on roadwork, the crushing plant should be so manned and organized that the crusher will be kept constantly full and at work. When the crusher is fed to the limit of its capacity, and the wagons are getting the stone to the roads, the best economy of operation will be reached.

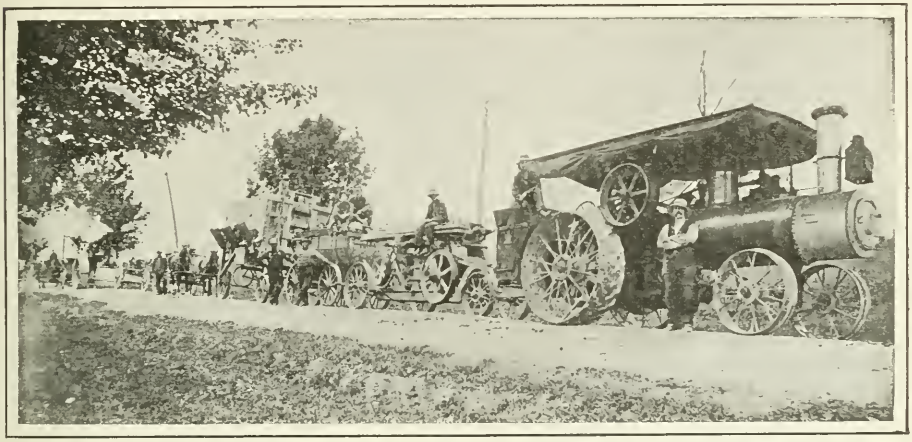
The stone crusher should be equipped with an elevator, rotary screen, and loading or storage bin. Bins with chutes may be built out of plank; or mounted on wheels, and readily portable, may be purchased from the road machinery manufacturers. Bins are a necessity for economical operation, and without them the time of teams and teamsters is wasted. The screen should be adapted to the material being crushed. If limestone, it is sufficient to separate the material into three grades; such as will pass a one-inch ring; such as will pass a 3 inch ring; and tailings, or material refused by the three inch ring. If granite or trap is being crushed, a fourth grade, dust, should be separated, for use on top of the road; and the other grades may be 1¼ inch, 2½ inch, and tailings. The several sizes, taken into the wagons through chutes from its compartment in the bin, are loaded at minimum cost, and may be placed in their proper position in the road.

Traction Engines.

Traction engines or steam tractors can be used for a variety of purposes: For hauling a grader, operating a crusher, moving equipment from place to place, and for hauling broken stone or gravel. Many municipalities rent traction engines from owners of threshing outfits at a very reasonable rate. For all

purposes of roadmaking an engine should be fairly heavy and powerful; and in this connection the difference between a "traction engine," and a "steam tractor" should be observed. A traction engine is intended chiefly for stationary purposes, but is equipped to move from place to place under its own power and draw a moderate load. A steam tractor is one which is especially built for hauling purposes, having the necessary weight and power. Wide driving wheels are of advantage in moving over earth roads. For road building purposes, the "steam tractor" should, in general, be purchased, as it can be put to the greater variety of uses.

Wagons of good design for spreading are an important feature. Boxes holding a yard and a half or two yards, are suitable for team haulage. A new type of wagon of 3½ yards to 5 yards capacity, is being offered, for haulage by steam tractors. On good roads, and in level country, the cars of large capacity may be



Portable Outfit of Road Machinery in Wellington County.

serviceable, but they lack the flexibility of smaller wagons, which can be handled either by horses or traction engines, and with less dependence upon the condition of the roads. Traction haulage, displacing horses, has various advantages, and for hauls of two miles or over show distinct economy, in cases reducing by one-half the cost of hauling gravel and stone.

Miscellaneous Equipment.

Steam hoists or cranes for unloading stone from cars are proving of value. The unloading of cars as commonly carried on in summer is hot, laborious work, which men are inclined to shirk. To empty stone from cars by means of a steam hoist does away with dependence upon men, and saves the time of teams wasted while the wagons are being loaded. A steam hoist, facilitating the handling of stone in a quarry, will permit the placing of crushed material in stock piles, and permits quarrying during the winter if desired.

Concrete paving or concrete road foundations can be most rapidly built by means of a mixer moving under its own traction, and with an arm and bucket for depositing the wet concrete in place.

Roadmaking equipment may include numerous additional implements: A derrick in the quarry to replace horses and carts; steam drills; sprinkling wagons with gasoline pumps for wetting the stone before rolling; a motor truck for handling stone or gravel, particularly for repairs; pick plows, wheel and drag scrapers, picks, shovels, and miscellaneous tools. The use of bituminous materials involves equipment for heating, and applying to the road; and special materials, such as sheet asphalt, or bitulithic require elaborate plant for heating and mixing, with special appliances for laying.

The art of road building and paving, as will be seen from the foregoing brief review, is becoming largely a matter of handling machinery and tools in which practical knowledge, experience and skill play a most important part. The care of these implements, their adjustment, cleaning, oiling, storage and protection, are in the highest degree important. A good workman is generally known by the condition of his tools, and well kept plant and equipment are often indicative of the ability of the road foreman or superintendent.

The Log Drag.

The log drag is a simple and cheap implement, but is capable of much usefulness. Ontario is just beginning to enter seriously upon the work of road construction. All roads cannot be macadamized or gravelled at once; but on the contrary, the task of properly constructing even the main roads is one which must take a number of years. A starting point in permanent road-building is necessary, and this is afforded by county road systems which form a nucleus, and which will no doubt be extended. But there will remain for many years in most counties a large network of earth roads not even gravelled in the ordinary township manner. Township councils could do no better work than to carry out the grading of these earth roads, and afterwords maintain them in this condition by the systematic use of the log drag. Spasmodic and casual use will accomplish little.

Reinforced Concrete Bridge in Halton County, near Oakville.—Completed.

While these implements are cheaply made and easily operated, farmers will not of their own good-will at once go out on the roads and keep them in repair. Township councils will have to take the matter up. If their use is still left to ordinary statute labour methods, permitting a farmer here and there, who desires it, to work out his statute labour by this means, the result will be inferior. A business-like system must be introduced. One to be recommended is:

1. That township councils take tenders and let the job of dragging and keeping in good condition, sections of earth road throughout the township: these sections not to exceed four miles in length, being preferably two miles in length, and not less than one mile.

2. That each person taking a contract be paid in cash the sum of his tender, which will probably be a small amount.

3. The work of those using the split-log drag should be inspected from time to time by the township road commissioner. When any person operating the drag is found to do inferior work or to neglect the roads, the work can be taken from him for the ensuing year.

Concrete Bridge in Halton County, near Oakville, in process of construction.

When earth roads have been graded (but not metalled with gravel or stone) keep them in repair with a log drag.

Split log drags are very easily and cheaply made. A log from five to seven feet long is split or sawn in half. The halves are placed parallel to one another, the edges down and flat face to the front. They are firmly braced together in this position with three cross-bars wedged into 2 inch holes bored through the log. A chain-hitch is attached in such a manner as to incline the drag at the desired angle, say forty-five degrees, the forward corner being at the outer edge of the road, and the rear corner at the centre.

By dragging this implement up one side of the road and down the other, making a number of circuits, using two or three horses, the edges of the log

plane off the tops of ridges and rough places, drawing the material sideways and forward to fill hollows and ruts, crowning it at the centre of the road. This drag, used eight or ten times during the year on an earth road, while the earth is in a moist condition after a rain, will keep an earth road in the best condition that an earth road can be made to reach.

Councils should establish a plan of dragging the earth roads systematically. It will not be done properly when left to statute labour or to individual effort. Sections should be let by tender, one or two miles in length, and the work inspected by the road superintendent. Counties having a system of county roads should follow the same plan on earth roads until their permanent construction has been reached.

Use a light drag, preferably of cedar, pine or basswood, such as can be readily managed by one team of horses, and use it often. Fasten strips of steel along the lower face edges of the drag from 2 inches to 4 inches wide, and 3/8 inch thick. A straightened wagon wheel, or sleigh runner, is ordinarily used.

Instead of making the drag with square ends, give the rear slab a set-back, so that, when the chain is hitched at the ordinary angle, the ends of the drag will be parallel with the sides of the road.

Use the drag when the road is very wet and slushy, either when raining or immediately after; or use the drag when the road has become somewhat dry, and the soil loose and friable. There is an intermediate stage in which the earth is sticky and rolls up in lumps, instead of spreading out smoothly.

If a clay road is dragged in the wet stage, a tough rubber-like surface is produced; but the road is very apt to be cut by traffic before it becomes dry.

Use the drag so frequently that the road is never really out of repair, and draw only a little earth to the centre at each operation. If the road is dragged only when very rough and flat, so that a great ridge of earth is piled at the centre, the best results are not reached.

Give the road a round contour—not two flat planes meeting at a sharp angle in the centre of the road. In doing this, a short, light drag is most serviceable.

Attach the end of the chain at the outer side of the drag to the cross bar; and the end at the centre, to a ring in front, or pass through a hole in the front of the drag. If both ends of the chain are fastened to the cross bars, there is a downward bearing on the front of the drag liable to upset it in a manner dangerous to the operator.

Length of chain changes the line of draft in such a way as to regulate the hold taken on the earth. To lengthen the chain is equivalent to putting a weight on the drag. If the drag is too heavy shorten the chain. To move more earth, lengthen the chain.

The cross bars should be nearer the top than the bottom, to allow the earth to pass underneath them.

In certain sticky conditions of the road the drag can be reversed, drawing the round face forward.

Place a couple of planks over the cross-bars for the operator to stand on. The operator can then regulate the work of the drag by moving from one end to the other.

The operator should have a shovel with him to trim the drains and edges of the road; or a crow-bar to pry out boulders, logs and stones. He can use these when the horses are resting.

To straighten the road, or deepen the drains, or cut down high shoulders, plow the sides, and cut up the loosened earth with a disk harrow. It can then be drawn in gradually with the drag. Turn over only one or two furrows at a time, and drag in a little at each operation.

If the drag becomes clogged with mud, weeds or sod, stand as far as possible from the ditch end. To fill a low spot or mud hole, step quickly from the ditch-end of the drag to the end at the centre of the road.

By means of the drag, together with the plow and harrow, much can be done to grade a new road, particularly if the land is moderately level and the soil not a heavy clay. But this work is apt to be extravagant of labour, and should be done with a grading machine.

Handles on the drag are a decided advantage.

Watch for the last freeze-up in the fall, and drag the road just before it, so as to get a smooth base for the snow road. Very little snow will then make good sleighing.

The nature of the soil, varying from a stiff clay to a light sand, influences the use of the drag. Study the results produced by the drag under all conditions of soil, season, and material.

Skill born of careful observation and practice is needed. Do not expect the best results at first.

SPECIFICATIONS FOR ROAD MACHINERY.

The following specifications were employed by the Highways Office in the purchase of road machinery.

It is the general purpose of these specifications that the tender shall be based on the best grade of the machine or implement in question, as regards material, design and workmanship, and that all tenders shall be upon the same general basis, but every manufacturer or his agent submitting a tender, shall supply for each article a specification of the article to be supplied by him.

The word "purchaser" shall mean the Minister of Public Works for the Province of Ontario or any officer authorized to act upon his behalf in respect to these specifications.

The word "tenderer" shall mean any party or parties tendering upon, and contracting to supply any machinery or equipment stated in, or implied by these specifications, or the legal representatives of such party or parties.

Tenders will be considered for any or all of the items enumerated in these specifications, but a tender will not be considered for a sub-division of any such items.

Prices stated by the tenderer are to be for delivery f.o.b. Winchester, Ontario. Prompt delivery is desired and will be given preference by the purchaser. Delay from any cause beyond the time specified for delivery by the tenderer will be cause for withdrawing any order given under these specifications.

All material, design and workmanship are to be of the best grade.

Preference will be given to machinery having the qualities stated in these specifications, and the lowest or other tender will not necessarily be accepted.

(1) Steam Roller.

The roller is to be a nominal ten ton steam roller having a minimum weight of 20,000 pounds exclusive of coal and water, and is to be equipped with all tools, fixtures and appliances required for ordinary operation and including two sets of picks, long and short; a suitable draw-bar for hauling to the full capacity of the engine; fixtures for attaching a grader, scarifier or wagons; detachable cover and fixed canopy; a suitable brass name-plate attached to the roller, bearing the words "Province of Ontario."

The following particulars are to be given by the tenderer:

(1) Name, maker, and place of manufacture;

(2) Indicated or brake horse-power and revolutions per minute;

(3) Number of cylinders, diameter and stroke;

(4) Grate area, heating surface, and number and diameter of tubes;

(5) Working steam pressure, and guaranteed fuel consumption, using three-quarter lump coal, per day of ten hours;

(6) Coal and water carrying capacity;

(7) List and description of all tools, equipment and appliances included in the tender.

The successful tenderer shall provide the services of a capable engineer to run and demonstrate the operation of the roller for a period of six actual working days, after delivery of the roller, at such time and place as the purchaser may designate, a day to consist of 10 hours, or such part thereof as the purchaser may require. The roller during such period shall be entirely at the disposal of the purchaser, and shall perform such work as he may direct, for the clear demonstration of the qualities of the roller and of its compliance with the terms of this specification, and with the tenderers' further guarantee.

The operator provided by the tenderer shall, if so required, instruct a man designated by the purchaser, in the use and operation of the roller and all its parts.

If, during such period of demonstration, the roller with all fixtures and attachments, is found to comply with the terms of this specification, and with the statements and guaranteed claims of the tenderer, to the satisfaction of the purchaser, the purchaser will give the tenderer written acceptance thereof.

Should the roller not comply with these specifications, or if it is not found to satisfactorily meet the requirements of the purchaser, during the period of demonstration, the tenderer shall thereupon remove the same from the work at his own cost, when so directed by the purchaser, and the tenderer shall have no further claim for costs or other loss or expenditure.

The price submitted by the tenderer shall include all charges, costs and expenditures up to the date of written acceptance by the purchaser, and nothing in this specification or in any order, communication or direction shall be deemed to mean that the roller has been accepted by the purchaser until after the period of demonstration has expired and the written certificate of acceptance has been given by the purchaser.

(2) Stone Crusher.

The stone crusher is to have portable mounting, and shall preferably have a steel frame. The minimum capacity is to be 12 tons of crushed limestone per hour, of two-inch product. The jaws are to be of especially durable steel. All main bearings are to be of brass, well protected from dust, with no open oil

holes. All bolts are to be lock-nutted. Material, design, and workmanship throughout are to be of the best. The tenderer shall state the name, maker and place of manufacture of the crusher, and shall fully specify and describe such machine.

With the crusher there are to be supplied all necessary minor tools and implements in addition to the following:

One extra set of jaws.

One revolving screen of proper length, and diameter, of ¼ inch perforated steel plates, with detachable dust jacket, and two sets of perforations, 1-inch and 3-inch.

One portable storage bin, of 20 tons minimum capacity, with compartments adjustable to the output of the crusher.

One steel, adjustable, telescopic or folding chain bucket elevator of adequate length.

(3) Rock Drill.

The steam drill is to be adapted for temporary installation, and is to include hose attachment, and spare drills, tools, covering, etc. The tenderer is to state the horse-power required for economical operation, the fuel consumption, the name, maker, and place of manufacture, together with a list of equipment supplied.

(4) Spreading Wagons.

Wagons are to be of one and one-half (1½) cubic yards capacity, and are to be fitted for horse traction or for hauling in train behind a traction engine. The wagons are to be capable of spreading the stone on the roadway to the desired uniform depth, by means of a convenient operating device.

(5) Sprinkling Wagons.

The tank wagon is to be adapted to country road construction, and is to be equipped with a convenient hand-pump for filling. The tenderer is to state the capacity of the tank in Imperial gallons, the width of tires, and net weight.

CONCRETE ROADS AND PAVEMENTS IN ONTARIO.

The use of cement concrete as a surface material for roads and streets has recently been given much attention throughout the Province. No paving material can, to the civil engineer of safely conservative judgment, be fully accepted as of standard merit, until its durability has been determined over a period sufficient to indicate its qualities under varying conditions of actual service. What that length of time is, cannot be definitely stated, except in relation to the anticipated service and life of each material; but in general, fifteen or twenty years is necessary to finally fix the place and merits of a paving material, and to give safe information as to detail of construction and maintenance.

The extended use of cement-concrete in sidewalks has supplied a large amount of information leading to its successful use as a paving material, but no concrete pavement laid in Ontario under proper conditions has yet been down the full term of its life, nor has practice in construction yet passed entirely beyond the experimental stage. Various problems remain to be solved, and improvements will in all probability be effected, through experiment and experience.

The principal objections to concrete as a material for roads and pavements have been that the surface is too hard to give a proper foothold for horses; that it is rigid and therefore hard on the feet of horses; that it reflects heat and has an unpleasant glare; that it is brittle; that expansion joints chip at the angles and under constant traffic deepen to holes; that cracks have so far been unavoidable, are difficult to repair, and, like expansion joints, chip at the corners.

On the other hand, it has been recognized that were these difficulties overcome wholly, or in part, concrete has certain merits. It is low in first cost, as compared with other high-class pavements, and is one of the cheapest materials yet available for a permanent pavement or roadway.

Among the questions which the future will more freely determine, will be the relative values of washed gravel, pit gravel, and broken stone; the relative values of one-course, and two-course construction: the most satisfactory spacing and treatment of joints; the prevention of cracks: the production of a tougher and less brittle concrete; the surface treatment to afford a better foothold for horses; the necessity for steel reinforcement.

Typical Pavements.

Among the older concrete pavements in Ontario, have been those at Windsor, Brantford, Chatham and Toronto. The town of Dunnville has paved the main street with concrete, while sections are laid in Woodstock, Peterborough and Port Arthur. In Toronto and Hamilton concrete has been used for a number of years for paving lanes, while Toronto has used it also between street car tracks with fairly satisfactory results.

The first concrete pavements to be laid in Ontario were in Windsor, in 1906, on Chatham and Church Streets; and there are now about twelve miles laid in that city. These are all two-course pavements. The specifications for 1912, provided for a 4½-inch base of 1: 2: 4 concrete, and a 1½-inch surface of 1: 2 concrete, using washed sand and gravel from the River St. Clair. In the older pavements, there has been considerable longitudinal cracking, but joints and cracks have been protected by filling with tar which is spread to a width of

about four inches over the surface. The experiment is being made at Windsor by the City Engineer, of using meshed fence-wiring between the top and bottom courses; and of placing longitudinal joints next the curb; both reinforcement and joint being with a view to preventing longitudinal cracks.

The City of Brantford has a private driveway laid in 1900, which has been subjected to a heavy traffic, with very satisfactory results. A block was laid in 1910 on a short residential street. This is a 1: 6 mixture of cement and pit gravel, 6 inches in thickness. Transverse joints were made every 30 feet. Longitudinal cracks have developed. In 1911 another block was laid, a one course pavement of 1: 5 mixture using crushed gravel and sand, and the thickness is 5 inches. Longitudinal joints were left in the centre of a portion of the roadway; but as yet no longitudinal cracks have occurred at any point. Another short section was laid in 1912, a two-course pavement, 6 inches thick. The bottom course is a 1: 4 mixture, 4½-inches thick; and the surface 1½-inches is made of 1: 1½ mortar, using clean, sharp sand. As this pavement was laid on a grade varying from 5 to 8 per cent., transverse corrugations were made in the surface four inches apart, to improve the foot-hold for horses.

The County of York, in 1912, laid a one-course roadway on the Lake Shore Road, two miles in length. This is a one-course pavement, of 1: 2¼: 4 concrete, using pit gravel and broken limestone; and is seven inches thick. Transverse joints are made at 50 foot intervals, and the pavement was given a paint-coat of bitumen followed by a light covering of finely crushed granite. Other pavements of similar design were laid on private property adjacent to Toronto.

Use of Hydrated Lime.

For experimental purposes, and elsewhere referred to in this report, a concrete roadway was in 1912 laid by the Ontario Office of Public Highways adjacent to Windsor, where desirable material was obtainable, and results could be obtained

Reinforced Concrete Culvert in Carleton County.

in close comparison with concrete pavements laid by the city. This is on Tecumseh Road, a leading entrance to the city, and the westerly terminus of the old trunk roads between Windsor and Montreal. The concrete roadway is sixteen feet wide and seven inches thick, with broken stone shoulders 18 inches wide on each side, and blind stone drains from the bottom of the stone shoulders to the open gutters. Tile drains were laid on one side only, as the other side was served by a deep open ditch. The material used was clean river gravel using a 1: 4 mixture; and a section of fairly clean pit gravel, of similar proportions.

A leading feature of the experimental road at Windsor is the use of hydrated-lime in a section 800 feet in length. Experiments have in the past indicated that the expansion of concrete is as great through varying conditions of moisture as through change in temperature. Hydrated lime is recognized as one of the most efficient means of water-proofing concrete, making it denser, less permeable and less porous. It is believed that the principle may effectingly be adapted to pavements, and that a concrete rendered water-proof by this means would be improved in several ways. It is anticipated that a tougher material will result; that the action of frost on the dryer concrete will be less disruptive; and that the movement of the concrete through expansion and contraction, and causing longitudinal cracks may, wholly or in part, be overcome. A similar object was sought by the well-known experiments of the United States Office of Public Roads in the construction of concrete pavements containing a proportion of oil. The hydrated-lime used at Windsor was manufactured at the Prison Farm, Guelph, eight per cent. in volume of the Portland Cement being replaced by it in the mixture.

A Rich One-Course Mixture.

From the foregoing brief outline of experience and experiment with concrete pavements in Ontario, it is evident that actual steps are being taken to overcome its recognized deficiencies, to determine the best methods of construction and to define the class of traffic to which it is adapted. At the present time practice favours one-course construction, rich in cement, coupled with careful drainage of the sub-soil. Two-course design will no doubt lessen the cost in certain cases where suitable surface aggregate is expensive, as compared with local material available for a lower course. Narrow transverse joints are sought; and to prevent chipping under traffic they may be filled and painted with asphalt or tar, protected with a proprietory form of soft steel plate, or made by folding tar paper over a steel or wooden form and removing the latter while the concrete is still in a fluid state. Clean, washed gravel and sand are essential.

Loose stones, on a macadam roadway, crush more readily than when rolled into the crust and firmly supported on all sides by other stones. Similarly, stones embedded in Portland Cement mortar are reinforced on all sides so that wear becomes almost solely a matter of abrasion rather than of crushing. Stone is thus utilized to best advantage for wear, provided that concrete is found to be serviceable in other respects. Its low cost, apparent durability, and cleanliness renders it an apparently useful pavement for small towns and villages, and for country roads subjected to heavy automobile, motor truck, and teaming traffic at all seasons of the year. Should the concrete surface last for a term of ten or fifteen years, it is anticipated that it will still be in condition to receive a bituminous surface; a contingency which should be provided for in fixing the design and elevations, particularly the relative height of curbs on town streets.

Much may be anticipated from the use of concrete as a road-surface, but it should be recognized that the conditions under which it may be successfully used, have not yet been fully determined. As a paving material, it is already clear, however, that certain special features are necessary. Attempt to use concrete for roads in the careless way in which it is applied to other structures, will undoubtedly result in failure.

Concrete Road, near Windsor, Ontario.

SPECIFICATION FOR CONCRETE ROADWAY.

Scope of specifications.

1. The work covered by these specifications is to include the supplying of all labour, machinery, plant or materials which are needed to construct durably and expeditiously and to fully complete ready for travel, a concrete roadway which is, in general, to be straight and in the centre of the road allowance, with a uniform width and camber. Roads are to be given an easy, flowing grade, cutting hills and knolls, and filling depressions. The steepness of hills is in no case to exceed a rise of four per cent.

Plans, stakes, etc.

2. All work under these specifications is to be in accordance with the plans, profiles, and schedules forming part of these specifications, and to the lines and levels given on the ground by the engineer. Stakes and bench marks placed for this purpose are not to be moved or effaced without permission of the engineer.

General dimensions.

3. The width of road shall be uniform unless otherwise directed by the engineer, or as otherwise shown on the plan, for curves or other irregularities, width of grade between shoulders to be twenty-four feet, the width of concrete 16 feet, uniform depth of concrete 7 inches, and width of shoulders four feet.

Camber.

4. The finished concrete roadway is to be circular, having a uniform, even surface, without depressions, the camber of the concrete to be 1-96 of the width, or two inches in a total width of 16 feet. The shoulders are to have a fall of 1½ inches to the foot.

Excavation and fill.

5. Excavation or fill is to be made in all cases to the required depth below the elevation of the finished roadway. Surface soil, vegetable mould, logs, stumps, or other weak or perishable material are to be removed to sufficient depth to secure a firm foundation, and such excavation shall be filled with durable material to the height of the sub-grade. The sub-grade thus obtained is to be made thoroughly firm and solid by pounding and rolling. In swamp land, roots and muck are, if practicable, to be removed in advance of fill, to a firm bearing.

Roadsides.

6. The land at the sides of the road, between the gutters or open drains, and the fences, is to be graded from margin of the roadway, as may be directed, the roadsides to be left smooth by grading and levelling, care being taken not to injure or bark trees and shrubs that may be marked for preservation, or where such preservation is directed by the engineer.

Lane and road intersections.

7. All intersections of roads, lanes and entrances are to be properly graded, and stoned or gravelled as directed, to conform to the finished grades of the intersecting roadways; and tile or other culverts or crossings are to be well laid under instructions from the engineer.

Surface drainage.

8. Open drains or gutters shall be formed along each side of the roadway, of sufficient capacity to carry to an outlet all water entering them, the grade of such drains to follow where practicable that of the roadway, but preferably having a minimum fall of three inches in 100 feet. The slope of gutters is to be uniform and without pockets or depressions. On hills and hillsides, where suitable outlets cannot otherwise be obtained surface water shall be received into catch-basins at suitable intervals and discharged to an outlet through underground tile, vitrified sewer pipe being preferably used for that purpose. On hills, concrete or cobble-gutters may be required where the rush of surface water is likely to cause erosion.

Tile drainage.

9. Tile drains, where required to remove an excess of sub-soil water, to tap spings, to effectively dispose of surface water, to protect hills or road intersections, shall in general be placed along the side of the roadway, under the open drain or gutter, and shall be of not less diameter than four inches. The tiles are to be placed in an eight inch trench, the bottom of the trench to be 36 inches below the sub-grade of the roadway. They are to be uniformly and evenly laid with a fall of not less than three inches in one hundred feet to a proper outlet, and with ends closely abutting. All tiles used shall be of the best quality of clay, manufactured expressly for drain purposes, in lengths not less than one foot, and of uniform diameter throughout. Earth excavated in the laying of these drains shall be returned to the trench, being consolidated on hills or slopes if considered necessary by the engineer, to prevent its being washed out, and in every case so disposed of as not to interfere with surface drainage. Where the bottom of the trench is in quicksand, satisfactory means are to be used to keep the tile in a true line, and free from sediment, by laying on a board, surrounding with cinders, sawdust, cotton or cheesecloth. Where in the opinion of the engineer, there is likelihood of the tiles being obstructed by roots of trees, the tiles are to be surrounded to a distance of twelve inches with finely broken stone, placed as directed by the engineer.

Side slopes.

10. Side slopes in cuts and fills are to be one and one-half feet horizontal to one foot vertical. Earth for fills on side hills and through ravines, where the grade cutting does not provide sufficient material, is to be obtained from the tops of hills, or such other point as directed in order that the natural slope of the earth may be maintained and slipping prevented as far as practicable.

Concrete tile culverts.

11. Concrete tile culverts where required are to be of such size and length and at such depths as may be determined by the engineer, and are to be placed where shown on the plans hereto attached. Culverts are to be laid with a good fall and free outlet, so that water will not stand in them. The spigot end is to be down grade and joints are to be fitted and made tight with cement mortar. The trench to receive the tile is to have a concave bed, so that the tile will have an even bearing, the earth is to be firmly packed and rammed around the tile, and a minimum depth of one foot of earth is to cover the tile. Each end of the culvert

is to have a concrete headwall sunk below the frost line and of such dimensions as may be necessary for a retaining wall to suit the situation. Concrete tile are to be strong and of the best quality, sound, free from all defects, smooth, uniformly circular and made in accordance with an approved specification.

Catch basins.

12. Concrete catch basins in accordance with the plans hereto attached are to be placed and connected with tile drains at such point and at such depth as the engineer may designate, iron covers for this purpose, of design approved by the engineer, to be provided.

Portland cement.

13. Cement must be of a favourably known brand of Portland cement, approved by the engineer in charge of the work, and complying with the requirements and tests of the Canadian Society of Civil Engineers for Portland cement. It shall be delivered in suitable receptacles and carefully protected from dampness by proper storage. The packages shall not be laid on the ground, but shall be placed on boards raised a few inches from it.

Fine aggregate

14. Fine aggregate shall consist of sand, crushed gravel or stone screenings, passing when dry a screen of one quarter inch mesh; and not more than 6 per cent. passing when dry a screen having 100 meshes to the lineal inch. The material shall be clean, sharp, silicious, and of varying sized grain.

Broken stone.

15. Broken stone shall be granite, trap, quartzite, fine-grained limestone, or other equally strong and durable stone, approved by the engineer, care being taken to exclude soft limestone, friable sandstone, and stone affected by the atmosphere. The stone is to be clean and free from clay, loam, or other earthy material. The size shall be such as is retained on a one-quarter inch mesh, and in largest dimensions will flow readily, but will not separate from the mortar in laying, preferably passing a 1½-inch mesh.

Gravel.

16. Gravel, if used in its natural state in making "fine" concrete, shall be of uniform character and of varying sized grain, making a dense and compact mass, such that the smaller particles will fill the voids between the larger, the largest stones therein to be such as will flow readily but will not separate from the mortar in laying. Gravel shall be clean and free from earthy mould or organic matter. Should there be insufficient fine material to properly fill the voids and make a compact mass, the deficiency shall be corrected by the addition and mixing of such quantity of sand, and in such manner as may be required by the engineer or inspector in charge of the work. Should the gravel to be used contain an excessive amount of sand, loam, large stones, or other objectionable material, it shall be screened through a mesh of proper size. Where the sand and fine stuff is thus removed the resulting mass of pebbles shall be treated as broken stone, and sand shall be mixed therewith in the manner herein described for broken stone concrete. Where large stones only are removed the material shall be treated in the ordinary manner for gravel concrete.

17. The water used is to be clean, free from oil, acid, alkali or vegetable matter, and the mixture must be sufficiently wet to flow into place without permitting the separation of the coarser aggregates from the mixture. Water.

18. The concrete is to be laid in one course, uniformly seven inches in consolidated depth, and consisting of one part of cement, two parts of sand and four parts of broken stone. The proportioning of materials may be varied by the engineer on the basis of voids in the aggregate, to secure a compact mixture, but the amount of cement is also to be determined by the strength of mortar required and developed. In no case is less cement to be used than is needed to fill the voids in the sand or fine aggregate when dry; but the interstices of the coarse aggregate should be measured, and at least sufficient mortar used to fill the voids and give a 10 per cent. surplus. When natural gravel is used the proportions shall in general be one part of cement to four parts of gravel, but shall be similarly varied for density, and strength developed, as directed by the engineer. Proportion for density.

19. The ingredients for all concrete shall be carefully measured by an approved method to insure correct proportions, and are to be thoroughly mixed to the desired consistency, the cement uniformly distributed, and the mass homogeneous and of a uniform colour. Thorough mixing.

20. When conditions will permit, a machine mixer is to be used. It is to be of a type approved by the engineer, and such as will ensure the perfect intermixing of the materials employed. Machine mixing.

21. Where gravel concrete mixed by hand is used the concrete shall be mixed on a water-tight box or platform placed close to the work, by first spreading evenly a layer of gravel, upon this shall be spread a proportionate quantity of cement, and the two thoroughly intermixed in a dry state. To this sufficient clean water shall be slowly added, and the whole again thoroughly mixed and brought to a proper consistency. Fine concrete. Gravel.

22. Where broken stone concrete mixed by hand is used, the concrete shall be mixed on a water-tight box or platform placed close to the work, by first spreading evenly a layer of sand, upon this shall be evenly spread the proportionate quantity of cement, and the two thoroughly mixed in a dry state. To this water shall be added, and the whole thoroughly mixed until a good mortar is formed. The proportionate amount of stone after being dampened, shall then be spread evenly over the mortar and thoroughly intermixed therewith. Broken stone.

23. Cement mortar shall be a mixture of sand and cement in the required proportions; the sand and cement to be first mixed in a dry state, then sufficient water added to properly moisten, and the whole again thoroughly intermixed. Where cement mortar is applied to a concrete base it shall be put in place before the latter has set, so that a Cement mortar.

perfect bond between the two shall be secured, the surface to be floated and trowelled until smooth and even, and otherwise marked as required for the work in which it is used.

Laying the concrete.

24. While the work is in progress it shall be so arranged that a steady supply of mixed concrete shall pass from the mixing box to the point where it is to be placed, and in no case will concrete be used after it has taken its initial set. The re-tempering of concrete will not be allowed.

Weather conditions.

25. Concrete is not to be laid in wet or freezing weather unless arrangements approved by the engineer, are made for heating all materials, and maintaining a temperature above freezing until the concrete has set. When weather conditions are unfavorable, work is to be discontinued if so directed by the engineer.

Protecting concrete.

26. Exposed surfaces are to be kept wet by sprinkling and covering with sand, sawdust, loam or other suitable material for one week after the concrete is put in place, care being taken to prevent pitting.

Temperature joints.

27. Temperature joints extending completely through the pavement are to be made every 30 feet, to be 1-3 inch in width, and filled with an approved quality of tar or asphalt. Such joints are to be straight and true, and perpendicular to the axis of the roadway.

Shoulders.

28. When the concrete pavement is not abutted by a curb and gutter, there shall be provided instead a shoulder of gravel or broken stone of a thickness at least equal to that of the pavement and of a width of at least three (3) feet. These shoulders shall be thoroughly rolled and compacted and shall be given a transverse slope away from the pavement of not less than one and one-half (1½) inches for each foot of width. Under such conditions, the edges of the pavement shall be so sloped as to form a bevelled joint between the pavement and the shoulders.

Where gravel or stone shoulders are not specified, weeping drains of coarse gravel or crushed stone shall intersect the clay or earth shoulders from the concrete to the open drain or gutter so as to prevent the collection of moisture underneath the pavement; the weeping drains to be placed at depressions, changes of grade, or at such intervals as may be determined by the engineer.

Finishing.

29. The concrete shall be tamped until the mortar flushes to the surface; it shall then be struck off to finished grade. The surface shall be finished with a wooden float and before complete hardening has taken place shall be roughened with a stiff broom or brush. After tamping, and until complete hardening, the workmen shall not be allowed to walk upon the concrete, but shall use planks or bridges if any work upon the surface is necessary.

Sub-grade.

30. The sub-grade is to be uniformly seven inches below the surface of the finished roadway, is to be thoroughly consolidated by wetting and by rolling, and is to be in a moist condition when the concrete is put in place. A light layer of gravel or sand is to be sprinkled over a clay or other tenacious sub-soil if so required by the engineer.

Forms.

31. Forms are to be used such as will properly mould and guide the work to the required lines and grades. Metal or wooden forms may be used, but must be free from warp, sufficiently rigid to retain their shape when properly staked, and shall be strongly and carefully staked to the established lines and grades. Forms are to be kept clean, wooden forms to be wetted or oiled, and metal forms to be oiled. Templates are to be used such as will produce a true and even camber and surface.

Hydrated Lime.

32. Where hydrated lime is to be used in the concrete, an amount not exceeding ten per cent. (10%) by volume of the Portland Cement in the mixture, is to be thoroughly intermixed dry with the Portland Cement, immediately before being used in the concrete.

TOWNSHIP ROAD MANAGEMENT.

Township councils primarily have control of the roads within their boundaries, except such as have been assumed by the county council, or are within a town, village or city. Statute labour was for many years the chief means of township road improvement. Numerous townships have, of recent years, exercised their power to wholly commute or abolish statute labour by by-laws.

Statute labour has, in the past, done much for the roads of the Province, but with changing conditions, it is becoming unsatisfactory. An examination of the statute labour system from the standpoint of a business organization shows clearly that it is not a sound basis for permanent road development.

Townships which have wholly commuted or abolished statute labour have not always put a good system in its place. Unless good management is substituted, there is very little reason for displacing statute labour. Good management in any business undertaking implies that:

A Well-known Method of Road Improvement.
Sods and clay, cleaned from the ditches, and roughly spread on the roadway, is not an ideal plan of performing statute labour.

1. *Responsibility should be definitely centralized in one manager* so that there is a strong incentive for him to obtain the best results and avoid mistakes. This is obtained by having one foreman or overseer, in place of one hundred or more overseers of statute labour.

2. *The undertaking as a whole, and each detail of it should be carefully studied and planned in advance.* This can only be done by making it the permanent business of one man, who can advise and guide the council from year to year.

3. *Experience and skill should be brought to bear on the work.* A township foreman should be kept in office just as permanently as is a clerk or treasurer,

and in this way only, can townships build up an efficient plan of experienced road management.

In carrying out the system under one foreman, it is apparent that success must largely depend on the choice of a man for foreman or overseer. That is true in any business. If an inefficient man is selected and there is a complete failure for the first year, it does not mean that statute labour should be retained —but merely that the council should appoint a better foreman. At the same time, too much must not be expected of an inexperienced foreman for the first year.

In placing responsibility on him for results, he must be given corresponding authority, especially in the matter of hiring or discharging men and teams. The council should decide the work to be done, but the doing of the work should be in his hands.

A good foreman can, as time goes on, make a complete study of the local road situation, the relative importance of the various roads, the grading, drainage, and bridging required on each, and the location of gravel or stone. With this knowledge he can be a most valuable guide to succeeding councils just as the township clerk is in other matters.

The work for the year should be decided upon as far as possible before spring opens. The foreman can then commence grading early in the season, before the ground is hard and baked. In July, August and early fall, when streams are low, he can put in small bridges and culverts.

He could arrange to have all earth roads kept in repair by use of the log drag. Gravelled or stone roads could be repaired when they need it. The gravelling or stoning of roads could be looked after at the best season of the year, in the winter when farmers would be glad to get the work. These are details which will depend on the local conditions in each township, and should be adjusted accordingly.

Under ordinary circumstances, every road in the township would receive its proper attention, either by dragging, grading, draining or metalling. The log drag in particular can be of enormous benefit, if its use is systematically arranged.

TOWNSHIPS IN WHICH STATUTE LABOUR IS COMMUTED OR ABOLISHED.

Township.	County.	System as it affects Statute Labour.	Year change was made.	No. of Road Divisions.	No. of Road Commissioners or Overseers.	Special Road or Commutation Rate.
Adjala	Simcoe	Wholly commuted	1904	9	9	60c. per day.
Armour	Parry Sound Dist.	22 divs. commuted	1905			$1 00 "
Assiginack	Manitoulin	Wholly commuted	1904	3		75c. "
Atwood	Rainy River	" "	1902	1	1	$1 00 "
Barton	Wentworth	" "	1894	8	8	35c. "
Bayham	Elgin	" "	1903	4		$1 00 "
Bedford	Frontenac	" "		62	62	$1 00 "
Bertie	Welland	" "	1901	2	2	$1 00 "
Big Lake		" "	1912	5	3	$1 00 "
Billings	Manitoulin Dist.	" "	1908	5	4	$1 00 "
Binbrook	Wentworth	" "	1896	25	25	50c. "
Blanshard	Perth	Abolished	1899	60	60	
Blenheim	Oxford	22 divs. commuted	1898			50c. "
Brantford	Brant	Partly commuted	1905	1	1	75c. " or $\frac{19}{20}$ mill.
Burford	Brant	" "	1898			50c. per day.
Caldwell	Nipissing	Wholly commuted	1909	4	1	$1 00 "
Carnarvon	Manitoulin	" "	1904	5	5	75c. "
Carlaw	Hastings	" "	1901	5	5	$1 00 "
Casey	Nipissing Dist.	Abolished	1909	4	11	6¼c. per acre.
Cassimer, Jennings and Appleby	Sudbury Dist.	"	1911	3		$1 00 per day.
Cavan	Durham	Wholly commuted	1902	58	58	75c. "
Chamberlain	Nipissing Dist.	Abolished	1912	14	1	6 mills.
Chapman	Parry Sound Dist.	Wholly commuted		4		$1 00 per day.
Chapple	Rainy River Dist.	Abolished	1909	1	1	
Charlottenburg	Glengarry '	Wholly commuted	1905			50c. per day.
Clinton	Lincoln	Abolished	1898	4	3	
Cobden	Algoma	Wholly commuted	1903	1	1	$1 00 per day.
Colchester, N.	Essex	Abolished	1904	5	5	12 mills.
Colchester, S.	Essex	"	1904			
Coleman	Nipissing Dist.	"	1906	1	1	7 mills.
Cumberland	Russell	Wholly commuted	1908	4	5	50c. per day.
Darling	Lanark	" "		24	24	$1 00 "
Delaware	Middlesex	" "	1903	4	4	50c. "
Derby	Grey	Abolished	1902	4	5	4 mills.
Dilke	Rainy River Dist.	Wholly commuted	1904	1	1	$1 00 "

Dorchester, S.	Elgin	Wholly commuted	1893	4	4	
Douro	Peterboro'	Partly commuted	1911			75c. per day.
Dover	Kent	Wholly commuted	1904	66	64	40c. "
Downie	Perth	Abolished	1901–02	5	5	
Draper	Muskoka Dist.	"	1909	7	7	12 mills.
Drury, Denison and Graham	Sudbury Dist.	"	1905	3	5	9 "
Dumfries, S.	Brant	Wholly commuted	1901	1	1	75c. per day.
Dymond	Nipissing Dist.	" "	1908	26	5	$1 00 "
Dysart	Haliburton	Abolished	1901	29		
Emo	Rainy River Dist.	"	1911	3	3	
Enniskillen	Lambton	Five divs. commuted	1903			$1 00 per day.
Essa	Simcoe	Abolished	1904	4	5	3 mills.
Etobiconke	York	Partly commuted				$1 00 per day.
Fitzroy	Carleton	Wholly commuted	1902	3	3	$1 00 "
Flamboro' East	Wentworth	" "	1903	4	4	75c. "
Fullarton	Perth	Abolished	1901	5	5	¾ mill.
Gloucester	Carleton	Wholly commuted	1901	5	2	50c. per day.
Gordon	Manitoulin	" "	1908	7	7	$1 00 "
Gosfield, S.	Essex	Abolished	1902	4	4	
Goulburn	Carleton	Wholly commuted	1902	4	3	60c. per day.
Gower, N.	Carleton	Abolished	1909	2	2	1 1-10 mills.
Grantham	Lincoln	Commuted	1912	1	1	75c. per day.
Grimsby, N.	Lincoln	Abolished	1892	2	2	60c. "
Guelph	Wellington	"	1902	4	4	1 7-10 mills.
Hamilton	Northumberland	Wholly commuted	1903	5	5	40c, per day.
Hanmer	Sudbury Dist.	" "	1912	5	5	$1 00 "
Harley	Nipissing Dist.	Abolished		4	4	13 mills.
Harris	" "	Wholly commuted	1911	9	9	$1 00 per day.
Hawkesbury, E.	Prescott	Partly commuted	1902	5	5	$1 00 "
Hawkesbury, W.	"	Wholly commuted	1905	3	3	$1 00 "
Hilton	Algoma	" "	1904	11	1	$1 00 "
Hilliard	Nipissing Dist.	" "	1911	14	14	$1 00 "
Himsworth, S.	Parry Sound Dist.	Abolished	1911	4	1	5 2-5 mills.
Howard	Kent	"		65	65	$1 00 per day.
Hudson	Nipissing Dist.	Wholly commuted	1909	12	6	50c. "
Huntley	Carleton	" "	1904	4	4	60c. "
Keewatin	Rainy River Dist.	" "	1888			$1 00 "
Keppel	Grey	Partly commuted		4	4	75c. "
Kerns	Nipissing Dist.	Abolished	1909	1	1	
Kingston	Frontenac	Partly commuted	1903		1	50c. per day.
Kinloss	Bruce	Six divs. commuted	1903		1	50c. "
Korah	Algoma Dist.	Wholly commuted	1902	4	14	$1 00 "
Laird		" "		11	12	75c. "
Lavalle	Rainy River Dist.	" "	1908	6	6	$1 00 "

TOWNSHIPS IN WHICH STATUTE LABOUR IS COMMUTED OR ABOLISHED.—*Continued.*

Township.	County.	System as it affects Statute Labour.	Year change was made.	No. of Road Divisions.	No. of Road Commissioners or Overseers.	Special Road or Commutation Rate.
Leeds & Lansdowne, R.	Leeds	Wholly commuted	1901	5	12	$1 00 per day.
Limerick	Hastings	" "	1911	1	1	$1 00 "
Logan	Perth	Abolished	1905	5	5	.....
Louth	Lincoln	Half commuted	1895	7	7	50c. per day.
Malden	Essex	Abolished	1890	4	4	.....
March	Carleton	"	1903	4	4	.....
Markham	York	Wholly commuted	1904	9	9	75c. per day.
Martland	Sudbury Dist.	Abolished	1909	5	1	10 mills.
McDougall	Parry Sound Dist.	"	1912	.....	.....	.....
McIrvine	Rainy River Dist.	Wholly commuted	1898	1	1	$1 00 per day.
McKellar	Parry Sound Dist.	" "	1905	7	7	$1 00 "
McKim	Nipissing	" "	.....	3	3	$1 00 "
McNab	Renfrew	" "	1912	4	4	$1 00 "
Medora and Wood	Muskoka	" "	1902	12	12	.....
Monaghan, N.	Peterboro'	" "	1896	6	6	75c. per day.
Monck	Muskoka Dist.	Abolished	1909	11	11	5 mills.
Murray	Northumberland	Partly abolished	1905	2	2	75c. per day.
Morley	Rainy River Dist.	Abolished	1908	2	2	.....
Nairn and Lorne	Algoma Dist.	Wholly commuted	.....	3	3	$1 00 per day.
Neebing	Thunder Bay Dist.	" "	.....	.....	.....	$1 00 "
Nelson	Halton	" "	1900	3	3	75c. "
Nepean	Carleton	" "	1904	1	1	$1 00 "
Niagara	Lincoln	Abolished	1903	2	2	.....
Norwich, N.	Oxford	Wholly commuted	1900	55	55	50c. per day.
Norwich, S.	"	" "	1901	55	55	50c. "
Oakley	Muskoka	Wholly commuted	1908	5	5	75c. "
Olden	Frontenac	Abolished	1909	4	4	3 7-10 mills.
Oliver	Thunder Bay Dist.	Wholly commuted	1905	4	4	$1 00 per day.
Orillia	Simcoe	Abolished	1904	7	7	6 mills.
Osgoode	Carleton	Partly commuted	1902	9	9	50c. per day.
Otonabee	Peterboro'	20 divs. commuted	1900	.....	.....	75c. "
Oxford, E.	Oxford	Wholly commuted	1903	5	5	60c. "
Paipoonge	Thunder Bay Dist.	Abolished	1908	3	3	.....
Pelee	Essex	Wholly commuted	1899	4	4	75c. per day.
Pickering	Ontario	" "	1900	21	21	75c. "
Pittsburg	Frontenac	" "	1908	5	5	50c. "
Plummer add'l	Algoma Dist.	" "	1901	8	8	50c. "

Portland	Frontenac	Abolished	1908	2	2	1½ mills.
Prince	Algoma	Wholly commuted	1909	5	4	$1 00 per day.
Puslinch	Wellington	" "	1903	4	4	75c. "
Ratter and Dunnet	Sudbury Dist.	" "	1910	15	15	$1 50 "
Rayside	Algoma	" "	1904	4	4	
Reach	Ontario	" "	1903	15	15	60c. per day.
Rochester	Essex	" "	1904	4	4	50c. "
Ryerson	Parry Sound	" "		3	3	$1 00 "
Salter and May	Algoma Dist.	" "	1902			50c. "
Saltfleet	Wentworth	" "	1903	5	5	50c. "
Sandwich, E.	Essex	" "		5	5	$1 00 "
Sarawak	Grey	" "	1896–1903	4	4	60c. "
Scarboro'	York	Partly commuted	1908	10	3	$1 00 "
Sherborne	Haliburton	Wholly commuted	1904	4	4	$1 00 "
Shuniah	Thunder Bay Dist.	Abandoned	1883			
Sidney	Hastings	Wholly commuted	1900	1	1	50c. per day.
Stafford	Renfrew	Abolished	1899	2	2	1 mill.
Stamford	Welland	Wholly commuted	1911	4	4	50c. per day.
St. Joseph's	Algoma Dist.	Abolished	1902	3	3	3½ mills.
Storrington	Frontenac	Wholly commuted				75c. per day.
Tarentorus	Algoma	" "	1903	1	1	$1 00 per day.
Tecumseth	Simcoe	Abolished	1903	6	6	1 mill.
Tehkummak	Manitoulin Dist.	Wholly commuted	1902	2	4	80c. per day.
Thompson	Algoma Dist.	" "	1911	3	1	$1 00 "
Tossorontio	Simcoe	" "	1904	5	5	50c. "
Tilbury, E.	Kent	" "	1904	5	5	60c. "
Tilbury, N.	Essex	Partly commuted	1898	30	30	
Tiny	Simcoe	" "		1	1	40c. per day.
Toronto	Peel	Wholly commuted	1905	4	4	75c. "
Toronto Gore	Peel	Abolished	1898	5	5	
Vaughan	York	Wholly commuted	1903	22	22	75c. per day.
Walpole	Haldimand	" "	1909	4	5	75c. "
Walsingham, S.	Norfolk	Partly commuted	1911	5	5	$1 00 "
Waterloo	Waterloo	Partly abolished	1909	5	5	$1 00 "
Watt	Muskoka Dist.	Partly commuted	1903	7	7	$1 00 "
Westminster	Middlesex	Wholly commuted	1902	4	4	45c. "
Westmeath	Renfrew	" "	1902	5	5	75c. "
Whitby	Ontario	" "	1900	10	10	60c. "
Whitby, E.	Ontario	Partly commuted		37	37	50c. "
Whitchurch	York	" "	1897			75c. "
Worthington and Blue	Rainy River Dist.	Abolished	1910	4	1	12½ mills.
Yarmouth	Elgin	Wholly commuted		100	100	75c. per day.
York	York	" "	1900	12	1	$1 00 "
Zorra, E.	Oxford	Partly commuted	1902	88		70c. "

MODEL BY-LAW FOR TOWNSHIPS.

By-law No. ....

A By-law respecting road improvement and maintenance within the Township of ——— and the expenditure of moneys thereon.

Whereas it is desirable that all work of highway improvement and maintenance should be under the supervision of a road commissioner acting under the direction of, and responsible to the council;

Be it therefore enacted by the Municipal Council of the Corporation of the said Township of , and it is hereby enacted,

1. That from and after the passing of this by-law no statute labour shall be levied or assessed against any person, resident or assessed, in this municipality.

2. That the council shall, in each and every year, in lieu of statute labour levy such amount as may be necessary upon the rateable assessment of the municipality, to be expended in the construction, improvement and maintenance of the roads and bridges of the townships.

3. That the sub-division of the public highways of the township into statute labour divisions, as at present, is hereby abolished.

4. That the council shall appoint a competent person as commissioner to oversee the construction and repair of the highways, bridges and culverts in and bordering on the municipality, such commissioner to hold office during the pleasure of the council, and at such remuneration as may be fixed by the said council.

5. That the council shall provide for his use all necessary books, pay sheets, notices, etc., required for the proper performance of his duties.

6. That the said commissioner is hereby appointed by the municipality, and of the Act to Prevent the Spreading of Noxious Weeds, with full power to prosecute any party or parties violating the same.

7. That the council may at any regular meeting set apart such sums of money as may be required for the improvement and maintenance of the highways, and for the purchase of road materials, tools, machinery, or for jobs and contracts.

8. That the treasurer of the municipality is hereby authorized to pay on the order of the said commissioner any sums which he may be directed so to pay by order of the council.

9. That a day's work for all persons engaged by the commissioner under this by-law shall consist of ten hours' faithful service, exclusive of the time spent going to and coming from work, but payment in all cases, except upon job or contract work, shall be by the hour, and shall be at such price per hour as may be agreed upon with the road commissioner.

10. That the duties of the road commissioner shall be as follows:

(*a*) To attend regular meetings of the council, or special meetings if so desired by the council, to receive instructions regarding works to be undertaken and carried on by him; also to report at meetings of the council as to the road work then in progress.

(*b*) To report to the council early in each year as to the work required the coming season, to carry out the instructions of the council with regard thereto, and to perform such business or other services as may be required of him from time to time under the instruction of council.

(*c*) To supervise all work of construction and repair on the roads and bridges within his division.

(*d*) To acquaint himself with the best methods of constructing and maintaining good roads, and of operating graders, crushers, rollers, and other road machinery used by the municipality.

(*e*) To employ, direct and discharge all men and teams required to carry on the work, and to purchase necessary materials.

(*f*) To see that all washouts, drain and culvert obstructions, bridge failures, and other unforeseen defects are repaired or guard-railed with the least possible delay, so as to prevent further injury to the road, or accident to the users of the road, and to act promptly in all cases of emergency.

(*g*) To keep an accurate record of the men employed and the work done, and to furnish (on forms prescribed by the council) pay sheets, accounts and vouchers to the council or road committee at proper intervals for their approval, in order that the municipal treasurer, under authority of their certificate, and upon being satisfied with the correctness of the statement, may issue cheques for the payment thereof.

(*h*) To see that all works (especially for the road grader) are staked out, and see that they are undertaken systematically so that no time be lost in taking men, teams and machinery from one part of the municipality to another.

(*i*) To keep stored and protected all machinery, tools and implements owned or used by the municipality, and to store and protect all supplies and materials not immediately used.

(*j*) To supervise the performance of all work done by contract, and certify as to its completion.

(*k*) To supervise the opening of snow roads under such regulations as, in the opinion of the council, the needs of the municipality may require.

(*l*) To report to the council at the close of each year, showing in detail the character, location and cost of each separate work undertaken.

(*m*) To engage overseers (or foremen) throughout the municipality, these in the event of a washout or sudden giving away of a culvert or bridge, to protect it and report at once to the road commissioner; to act promptly in any emergency; to make minor repairs as directed by the commissioner; to collect men when necessary and open snow roads; to furnish to the commissioner an accurate record of time and work done; to perform such other services as the road commissioner may desire, such as on earth roads to use the split-log drag; on new gravel or stone roads to keep the metal raked to place.

11. That the method of making payment of all road accounts shall be as follows:

(*a*) All accounts for machinery, tools and repairs to same, materials for roads, or labour, shall be certified by the road commissioner as being correct, before being submitted to the Council for payment.

(*b*) He shall clearly show in his certificate whether the expenditure is for construction or repair, for new machinery and tools, or for repair to machinery and tools, and in the case of materials and labour shall state the specific work or works or road or roads for which they were used.

(*c*) Two time books shall be furnished the foreman of each road division. The time-book shall be made up each Thursday night, certified by the foreman as being correct, and shall be immediately sent by him, under sealed cover, to the road commissioner.

(*d*) Time-sheets shall be made up by the road commissioner from the time-book, and shall include wages only.

(*e*) When the time-books are received by the commissioner he shall check them over, extend them, and make up the time-sheets therefrom.

(*f*) Payment of the amount of the time-sheets when countersigned by the Reeve and approved by the proper committee shall be made by the Treasurer to the road commissioner. He shall then proceed to pay the foreman or men, in accordance with the time-sheets, taking from each his receipt, opposite his name, for the amount paid him as set out in the time-sheet. In the event of a man being unable to sign his name, he shall make his mark, and the same shall be witnessed by a man other than the foreman or the commissioner.

(*g*) It shall be the duty of the Treasurer to pay all road accounts upon the certificate of the road commissioner, countersigned by the Reeve, and approved by the proper committee of Council.

(*h*) All accounts paid in accordance with subsections (*f*) and (*g*) of this section, are to be laid before Council at the next ensuing meeting for approval.

12. That by-law No. of this township and any other by-law, or parts of by-laws, contrary to, or inconsistent with the provisions of this by-law are hereby repealed.

INDEX

A

Abolition of Statute Labour according to townships (*tables*) 50-53
Accidents to be prevented by Township Commissioner 55
Accounting to be done by Township Commissioner; method of 55, 56
Annual levies by counties for Highway Improvement; by townships 10, 54
Appian Way, The (*with illustration*) 27
Asphalt, use of 15, 19, 40, 46
Asphalt (sheet), special equipment for 31

B

Binder courses 14, 16, 17, 21, 24
Bitulithic, special equipment for 31
Bituminous macadam road, type of (*with illustration*) 15
Bituminous materials, special equipment for 29, 31
Bituminous pavement for town street, type of (*with illustrations*) 21
Bituminous surface for concrete 40
Brantford, use of and specifications for concrete paving in 38, 39
Brick pavement (vitrified), type of (*with illustration*) 22
Bridge of reinforced concrete, near Oakville (*illustrations*) 32, 33
Bridges (county), number constructed in 1912; expenditure on; specifications for 9
Bridges (township), season for constructing 49
Broken stone for concrete roadway 44-46
By-law for townships (road) 54-56

C

Camber of concrete roadway 42
Canadian Society of Civil Engineers, requirements for cement by 44
Carleton County, expenditure on Highway Improvement by, 1912 10
Carleton County, reinforced concrete culvert in (*illustration*) 39
Catch basins for town streets; for concrete roadway 20, 21, 44
Cement (Portland), use of; proportions for concrete roadway 40, 44-46
Chatham, use of concrete paving in 38
Commissioners (permanent), appointed by township by-law; duties of 54-56
Commissioners (township road), number according to township of, 1913 50-53
Commutation rate for Statute Labour according to townships, 1913 50-53
Concrete, one-course *vs.* two-course 40
Concrete, method of laying and finishing 46
Concrete, use for model roads of 13
Concrete bridges, specifications for 9
Concrete bridge (reinforced), near Oakville (*illustrations*) 32, 33
Concrete culvert (reinforced), in Carleton County (*illustration*) 39
Concrete culverts, number constructed in 1912 9
Concrete curbing, use of 11, 20-22
Concrete mixer, use of 31
Concrete paving, future development of 38
Concrete road (one-course), type of (*with illustration*) 19
Concrete roads and pavements in Ontario 38-41
Concrete road near Windsor (*illustration*) 41
Concrete roadway, specifications for 42-47
Concrete tile culverts for concrete roadway 43, 44
Concrete waterproofed by means of hydrated lime 40
Cost of labour *vs.* cost of road machinery 28
Cost (unit) of Winchester, Windsor and Tecumseh roads 12, 13
County bridges—*See* Bridges (County).
County expenditure on roads, 1912 ..... 9, 10
County roads—*See* Highway Improvement Act.
County Road System, mileage according to counties of (1912); as nucleus of permanent road construction 10, 32
Cranes (steam), use of 31
Crossings for concrete roadway 42
Culvert (reinforced concrete) in Carleton County (*illustration*) 39
Culverts, number constructed in 1912 9
Culverts for concrete roadway 42-44
Culverts (for township roads), season for constructing 49

D

Day's work on township roads under Commissioner 54
Debenture debts assumed by counties for Highway Improvement 10
Demonstration of steam rollers by engineers provided by tenderer 36
Derrick, use in quarry of 31
Divisions (Road), number according to township of (1913) 50-53
Drag (Log)—*See* Log Drag.
Drainage for concrete roadway 43, 46
Drainage for roads and streets 16, 18-22, 40
Drills (steam rock), use of and specifications for 31, 37
Dunnville, use of concrete paving in 38
Dustless road-surfaces 15, 19

E

Earth roads, use of log drag on (*with illustration*) 18, 32
Earth shoulders, method of removing 16, 17, 29
Essex County, consideration of county system by 9
Excavation for concrete roadwork 42
Expenditure by township councils on roads 54
Expenditure under Highway Improvement Act, total and according to counties (1912) 9, 10
Experimental roads, cost of; types constructed in 1912 11

F

Fill for concrete roadway 42
Fine aggregate for concrete roadway 44
Finishing concrete roadway, specifications for 46
Foreman (one permanent) recommended for township roads, duties of 48, 49
Foremen (township), duties under township commissioner of; knowledge of machinery required of 28, 31, 49
Forms (moulding) for concrete roadway 47
French road (early), type of (*with illustration*) 25
Frontenac County, expenditure on Highway Improvement by (1912) 10
Frost, effect upon concrete of 40

G

Grade for concrete roadway 42
Grading, mileage of road improved only by (1912) 9
Grading machines, use of 29
Grading of earth roads by township councils 32, 49
Granite for concrete roadway 44
Grants—*See* Provincial grants.
Gravel, mileage of road surfaced with (1912) 9
Gravel, use of 15, 17, 19, 22, 24, 27, 40
Gravel for concrete roadway 44-47
Gravelling of township roads, season for 49
Guelph Prison Farm 40
Gyratory stone crushers, use of 30

H

Haldimand County, expenditure on Highway Improvement by (1912) 10
Halton County, expenditure on Highway Improvement by (1912) 10
Halton County, reinforced concrete bridge in (*illustrations*) 32, 33
Hamilton, use of concrete paving in 38
Hastings County, expenditure on Highway Improvement by (1912) 10
Highway Improvement Act, operations and expenditure under; mileage of roads improved and expenditure according to county 9, 10
Highway Improvement in townships, by-law respecting 54-56
Hoists (steam), use of 31
Huron County, consideration of county system by 9
Hydrated lime, use in concrete paving of 39, 40, 47

I

Inspection of log-dragging by township road commissioner 33, 34

J

Jaw stone crushers, use of 30

L

Labour (cost of) and road machinery 28
Lake Shore Road, use of concrete paving on 39
Lambton County, consideration of county system by 9
Lanark County, expenditure on Highway Improvement by (1912) 10
Laying of concrete, specifications for 46
Leeds and Grenville Counties, expenditure on Highway Improvement by (1912).. 10
Lennox and Addington Counties, expenditure on Highway Improvement by (1912). 10
Lennox and Addington, stone crushing on county roads of (*illustration*)..... 29
Levies (annual) by counties for Highway Improvement; by townships 10, 54
Lime (hydrated) use in concrete paving of 39, 40
Limestone for concrete roadway 44
Limestone for model roads 12
Lincoln County, expenditure on Highway Improvement by (1912) 10
Log Drag on earth roads, use of (*with illustration*) 18
Log Drag, township system recommended for use of; directions for making and using; duty of township foremen regarding 32-35, 49, 55

M

Macadam for model roads 11, 12
Macadam road (bituminous), type of (*with illustration*)..... 15
Macadam road (modern), type of (*with illustration*)..... 14
MacAdam, road as built in 1800 by (*with illustration*) 23
Machinery, need of foreman's knowledge of 28, 31
Management of township roads, principles of 48, 49
Massachusetts State Highways Commission, model roads built by 11
Middlesex County, expenditure on Highway Improvement by (1912) 10
Mileage of roads improved in 1912 .....9, 10
Minister of Public Works, purchase of road machinery under authority of 35
Mixer for concrete, use of 31
Mixing of materials for concrete roadway 45
Model and experimental roads, cost of; types constructed in 1912 11-13
Model by-law for township 54-56
Montreal-Windsor trunk road 13
Motor traffic as affecting types of construction 15
Motor truck for repairs, use of 31
Municipal Act, as concerning county bridges..... 9

N

Norfolk County, consideration of county system by 9

O

Oakville, reinforced concrete bridge near (*illustrations*).....32, 33
Office of Public Highways, co-operation of 9
Oil, use in concrete construction of 40
Old roads, methods of resurfacing (*with illustration*) 17
One-course mixture—*See* Concrete.
Overseers (Township Road), number according to township of (1913).....50-53
Overseers (Township Road), duties under Township Commissioner of 55
Overseers (Township Road), substitution of one for several recommended..... 48
Oxford County, expenditure on Highway Improvement by (1912) 10

P

Peel County, expenditure on Highway Improvement by (1912) 10
Penetration method of applying bitumen 15
Permanent township road foremen recommended 48
Perth County, expenditure on Highway Improvement by (1912) 10
Peterboro, use of concrete paving in 38
Plans in specification for concrete roadway 42

Portable outfit of road machinery in Wellington County (*illustration*) 31
Portable road machinery 30
Port Arthur, use of concrete paving in 38
Portland cement, use of 40, 44
Prince Edward County, expenditure on Highway Improvement by (1912) 10
Proportion of cement to sand and broken stone for concrete roadway 45
Protection of concrete 46
Provincial Engineer of Highways 9
Provincial grants, amount of (1912), total and according to counties 9, 10

Q

Quartite for concrete roadway 44

R

Reinforced concrete bridge near Oakville (*illustrations*) 32, 33
Reinforced concrete culvert in Carleton County (*illustration*) 39
Reports by Township Road Commissioner 54, 55
Residential streets, type of (*with illustration*) 20
Resurfacing old roads, method of (*with illustration*) 17
Retempering of concrete forbidden by specifications 46
Road-building material now in use 28
Road commissioner for township, by-law respecting 54, 55
Road commissioners or overseers, number according to township of (1913) 50-53
Road construction, expenditure on (1912) 9
Road divisions according to townships (1913) 50-53
Road improvement, a well-known method of (*illustration*) 48
Road improvement in townships, model by-law respecting 54-56
Road machinery, use of and specifications for 28-37
Road machinery, portable outfit in Wellington County (*illustration*) 31
Road material to be purchased by township commissioner 55
Road models (*with illustrations*) 13-27
Road rate (special), according to townships, 1913 50-53
Roadsides for concrete roadway 42
Rock drills, use of and specifications for 31, 37
Rollers (steam), use of and specifications for 29, 36
Roman road, type of (*with illustration*) 26
Rotary screens, classification of crushed stone by means of 30

S

Sand, proportions for concrete roadway of 45
Sandwich West (township of), contribution to Windsor model road by 12
Screen (rotary) for stone crushers 30
Shoulders for concrete roadway 46
Side slopes for concrete roadway 43
Simcoe County, expenditure on Highway Improvement by (1912) 10
Size of stone used by MacAdam and Telford 23, 24
Snow roads, opening under Township Road Commissioner of 55
Special equipment for certain processes 31
Special road rate according to township, 1913 50-53
Specifications for concrete roadway 42
Specifications for concrete section of Tecumseh road 13
Specifications for macadam, concrete and brick pavements 14, 15, 19, 21, 22
Specifications for road machinery 35-37
Specifications for Winchester and Windsor model roads 12
Spreading and sprinkling wagons, use of and specifications for 31, 37
Statute Labour abolished by township by-law 54
Statute Labour insufficient for log dragging; efficient system to follow abolition of 33, 34, 48, 49
Stakes for concrete roadway not to be removed 42
Steam drills, use of and specifications for 31, 37
Steam hoists, use of 31
Steam rollers, use of; weight and specifications for 29, 36
Steam tractors, use of 29-31
Steel bridges, specifications for 9
Steepness of hills where concrete roadway 42

Stone (broken and screenings), for concrete roadway 44, 45
Stone, mileage of road surfaced with crushed, 1912 9
Stone crushers, use of; types of and specifications for.....30, 36, 37
Stone crushing plant on Lennox and Addington County road (*Illustration*)... 29
Stormont, Dundas and Glengarry, consideration of county road system by 9
Street (residential) type of (*with illustration*) 20
Street (town), type of bituminous pavement for (*with illustration*) 21
Sub-grade for concrete roadway 42, 47
Superintendence, expenditure on (1912) 9
Superintendent, knowledge of machinery required of; inspection of log-dragging by 28, 31, 34
Supervision by Township Road Commissioner.....54, 55
Surface drainage for concrete roadway 43

T.

Tar, use of 15, 19, 38, 40, 46
Tecumseh Road, concrete section of 13, 40
Telford road, type of (*with illustration*) 24
Temperature joints for concrete roadway 46
Tenders submitted for log dragging; for various road machinery 33-37
Tile culverts, number constructed in 1912 9
Tile drainage for residential streets; for concrete roadway 20, 43
Tile drainage for Winchester model road 12
Time-books, time-sheets (township road), how made up 55-57
Tools, use of miscellaneous repairing 31
Toronto, use of concrete paving in 38
Town, special county grant to (1912) 9
Township, model road by-law for.....54-56
Township, special attention given to; special county grant to (1912) 9
Township Councils, grading of earth roads and use of log-drag under direction of; duty regarding Statute Labour 32, 34, 48
Township Road Commissioner, inspection of log dragging by; present number of; recommendation of one permanent; duties under township by-law of 33, 50-55
Township Road management 48, 49
Township Roads, type of (*with illustration*).....16
Township Treasurer, duties under road by-lay of 54-56
Townships where statute labour commuted or abolished 50-53
Traction engines, use of 30, 31
Tractors (steam), use of 29-31
Traffic (heavy and motor) as affecting pavements 15, 22, 40
Trap for concrete roadway 44
Truck (motor) for repairs, use of 31

U

Unit cost of concrete section of Tecumseh road 13
Unit cost of Winchester and Windsor model roads 12
United States Office of Public Roads, model roads constructed by; concrete experiments conducted by 11, 40
Unloading of cars by means of steam hoists 31

V

Village, special county grant to (1912) 9
Vitrified brick pavement, type of (*with illustration*) 22

W

Wages for workmen on township roads under commissioner 54
Water used for concrete roadway 45
Waterloo County, expenditure on Highway Improvement by (1912) 10
Waterproofing concrete by means of hydrated lime 40
Weather conditions and the laying of concrete 46

Weeds (Act to Prevent the Spreading of Noxious), Township Commissioner to administer 54
Weeping drains for concrete roadway 46
Welland County, expenditure on Highway Improvement by (1912)..... 10
Wellington County, expenditure on Highway Improvement by (1912) 10
Wellington County, portable outfit of road machinery in (*illustration*) 31
Wentworth County, expenditure on Highway Improvement by (1912) 9, 10
Width of concrete roadway 42
Width of roadway for residential streets 20
Winchester, macadamized roads in (*illustrations*) .....*Frontispiece*
Winchester model road constructed in 1912 .....11, 12
Winchester, stone quarrying and crushing in (*illustration*) 11
Windsor, (city of) contribution to Windsor model road by 12
Windsor, concrete road near (*illustration*)..... 41
Windsor model road constructed in 1912.....12, 13, 39, 40
Windsor-Montreal trunk road 13
Windsor, use of and specifications for concrete paving in 38, 39
Woodstock, use of concrete paving in 38

Y

York County, expenditure on Highway Improvement by (1912) 10
York County, use of and specifications for concrete paving in 39

PROCEEDINGS

OF THE

Eleventh Annual Meeting

OF THE

Ontario Good Roads Association

1913

Appended to the Annual Report of the Provincial Engineer of Highways

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CONTENTS

	PAGE
President's Address: T. L. Kennedy	7
Address: C. J. Foy, Perth	10
Address: James Sheppard, Queenston	12
Address of Welcome: H. C. Hocken, Mayor of Toronto	13
Address: Sir Edmund Walker, President Canadian Bank of Commerce	15
County Road Organization and Construction: W. A. McLean, Chief Engineer of Highways, Ontario	18
Address: Dr. C. O. Fairbanks, Petrolea	24
Technical Course in Highway Engineering: A. T. Laing, Toronto University	25
Road Maintenance: Dr. L. I. Hewes, Engineer in Charge of Maintenance Division, U. S. Office of Roads, Washington, D.C.	27
Address: Hon. J. O. Reaume, Minister of Public Works	32
Address: Jas. L. Taylor, Hamilton	33
Stone and Gravel Roads: E. R. Blackwell, Brockville	34
Wagon Tires: A. M. Rankin, M.P.P., Collins' Bay	36
County Roads: R. H. Fair, Kingston	38
Town and City Streets: G. G. Powell, City Engineer, Toronto	40
Town and City Streets: T. H. Jones, City Engineer, Brantford	45
Address: Hon. Martin Burrill, Minister of Agriculture for Canada	47
Financial Statement	52
Resolutions	53
Constitution	53

To the Honourable J. O. Reaume,

Minister of Public Works, Ontario.

Sir,—I have the honour to transmit, for publication, the proceedings of the Eleventh Annual Meeting of the Ontario Goods Roads Association held in the Dairy Building, Exhibition Grounds, Toronto, on Wednesday, Thursday and Friday, February 26th, 27th and 28th, 1913.

I have the honour to be,

Sir,

Your obedient servant,

W. A. McLean,

Commissioner.

Parliament Buildings, Toronto,
April 17th, 1913.

Ontario Good Roads Association

ELEVENTH ANNUAL CONVENTION

Wednesday, February 26th, 1913

Afternoon Session, 2 o'clock.

PRESIDENT'S ADDRESS.

THE PRESIDENT: When I first attended this convention some years ago the trend of discussion as well as the papers read were upon the subject: "Are Good Roads an Economic Necessity?" This same problem has been argued in every nation in the civilized world during the past decade and in every case the answer has been as with us, unmistakably in the affirmative. The problem which now looms up most prominently for our solution is the securing of a main system of highways throughout Ontario.

The solution of this problem will involve an immense amount of work. Every section of the province will have to be visited. It will be necessary to collect data on local needs, traffic conditions, physical features of the district, availability of building materials, and countless other details. Such data must not only be exhaustive but must be reliable as well. It will be necessary, moreover, through general discussions and the exchange of opinions to arrive at a definite understanding with each separate community. Having thoroughly summarized all local conditions the needs of the province in general can then be examined and local and provincial requirements so harmonized that a complete system of roads can be mapped out, so that every individual in Ontario will be served by a good earth, gravel, macadam or paved road according as traffic conditions render necessary.

Then comes the question as to who should pay for these roads. We have now colonization roads built by the Provincial Government and paid for by the province and township interested. Last year (1912) $700,000.00 was spent in this way. These roads are maintained by the townships themselves. It is no exaggeration to say that during the last ten years millions of dollars have been squandered on this class of roads, although in recent years the reports sent out by the Public Works Department have been a wonderful help to the townships. There is spent annually on these roads 1,100,000 days statute labor and over $1,400,000.00 cash.

Then we have the County Road System. In each county leading roads are set apart and if approved of by the the Lieutenant Governor-in-Council these roads are built by the counties subject to the inspection of the Chief Engineer of Highways and the Government pays one-third the cost of the same. These roads are maintained by the county.

During 1912 there was spent by the province $250,000.00 and by the counties $500,000.00. In my opinion this is an almost perfect act to enable the counties to build feeders to main highways.

Now we claim there should be a main system of highways constructed by the province, paid for by province, dominion, and county, and maintained by the province.

Roads were first built to enable the producer, or, in other words, the farmer, to reach his market. Producer and consumer must be brought together, and in order

that this might be accomplished more cheaply the roads were improved, but always at the expense of the farmer. Why has not the consumer been made to help pay for the roads? In Europe and the United States he has helped. The city dwellers, who are the consumers, have shared generously the expense of constructing main market roads, and in Ontario, the city of Toronto has for a second time last New Year's Day in a very striking vote of 4 to 1 endorsed the building of main market highways from its boundaries.

The last few years, however, has seen the advent of the automobile. This machine has revolutionized traffic conditions everywhere. For example, take the traffic of an August day of ten hours passing a point on Dundas Street, ten miles west of Toronto. The figures are:—

1908—6 motors, 0 motor trucks.	1908—71 carriages, 93 team waggons.
1910—181 motors, 1 motor truck.	1910—82 carriages, 110 team wagons.
1912—382 motors, 12 motor trucks.	1912—61 carriages, 128 team wagons.

This means that in 1912 traffic conditions had so completely changed that by far the greater users of the road were outside people who did not contribute one cent towards the maintenance. From the farmer's point of view, through foreign travel ruined his fruit or crop adjoining the road by choking it with dust, while clouds of dust and dirt filled his house and his roads went to pieces.

From the motorist's point of view his car was being ruined by rough roads and dust. Both farmer and motorist were dissatisfied and neither lost much love on the other. As a farmer myself, I have often wished that the man who invented the automobile was helping the inventor of barb wire to carry coals.

The farmer, however, must use the highways and we cannot keep the automobilist off. What then is the solution of this problem? I would say that we must have a new system of paying for these roads, and would add that as the Government for a consideration of $4 a year gives the motorist the license to drive on all Ontario highways, the Government should, therefore, do something towards the construction of roads that will withstand this growing traffic.

I cannot do better here than quote from the last speech from the throne: "It is not easy," it reads, "to over-estimate the importance from the point of view of both the Government and the community of a carefully considered scheme of improved highways, or good roads. Having regard to the appropriation last session of the sum of $5,000,000 for the making of roads and other improvements in the northern and north-western districts of the province (2 George V., c. 2) and the announcement made by my ministers that such action would be supplemented at the earliest moment by an appropriation for similar action with regard to highways generally in the older settled parts of the province, my ministers have decided that you will be asked at your next session (1914) to make provision for this purpose. In the meantime investigations will be made and information collected on which to base a scheme or plan for the carrying out of this very important work. Until such scheme is prepared it will be impossible to decide what sum will be required for the purpose, but it will doubtless amount to a much larger sum than $5,000,000."

In the United States the Government has at present a Commission at work on this problem of roads.

Their work is: First, to devise a plan that will insure an equitable distribution of the funds to the different sections of the United States.

Second, to determine whether the money should be expended in the construct-

ing of main arteries for interstate commerce or be expended on local branch lines that will serve merely as feeders for railroads.

Third, to devise a plan of co-operation with the different states that will be acceptable to them and ensure the co-operation of all with the Federal Government.

Fourth, to throw around the national funds such safeguards as will insure their proper expenditure and guard against waste.

Before any comprehensive system can be applied to either Ontario or Canada, some such idea as this must precede it.

There are three great methods of transportation—the king's highway, the railway and the waterway.

We have been promised a Federal Grant for roads improvement by Premier Borden. Last year he told us in answer to this Association's request: "My government will give money for road improvement—such money to be paid through the provinces—but they will not grant any money for maintenance of these roads."

While the promise has not been fulfilled yet, still I think we all agree that no future Government of Canada can grant large sums of money to railroads and canals—without including with them the king's highway.

They spend millions in deepening canals, so that a vessel formerly carrying 100,000 bushels of wheat can now carry 120,000 bushels, and it is the middleman or steamboat people who directly benefit. Then, again, the Dominion spends millions on railroads so that they can carry wheat and farm goods cheaply by cutting down grades, straightening curves, etc. Then, again, neither producer nor consumer has a direct benefit. But millions spent on roads will enable the farmer (who is the producer) to haul 100 bushels of wheat instead of 60 bushels, which will give him a direct benefit.

I am pleased to note that sample roads of both macadam and concrete have been built by the Ontario Government. Nothing to my mind is of greater educational value than a good road properly built. I have seen both the concrete and macadam roads outside Windsor, and it is enough to say that they have been built under specifications prepared by Mr. W. A. McLean, the Chief Engineer of Highways for the Province.

During the year 1912 county road building (outside the county of York) has slackened. This is no doubt due to the general opinion that seemed to prevail—that road legislation would be altered at this session of the House. This, however, has been postponed for one year, and no doubt during the year 1913 nearly all counties will mark time in road construction.

In conclusion, let me say—it takes three years at least to construct a road—the general Ontario rule is to spend only one year building a road and then let it go to pieces. This is not altogether the fault of the counties, for as soon as a road is built automobilists find it out and in a year or two another road has to be constructed—thus taxing the farmers more than they can stand, as the cost of maintenance is a direct yearly tax paid wholly by the county. In the counties of Lincoln and Peel are samples of good roads ruined this way by autos. However, this will be remedied shortly, no doubt.

ADDRESS.

C. J. Foy, Esq., K.C., Perth.

Mr. President and Gentlemen: I wish to take this opportunity of thanking the committee in charge of the arrangements for the privilege and the honour of addressing the Convention of the Good Roads Association this afternoon. I come from a county which is a pioneer in the work of good road building, and as such we claim at least a recognition at meetings such as these, and we always feel at home whether we are directly represented or not.

Good road making is, probably without exception, the most necessary work that can be undertaken by any organization or aggregation of men. It is nothing more or less than the completion of a link in the large problem which has confronted both the people and the government at all times: that is, transportation. In days past Governments have shown adherence to the large transportation companies and have always been lavish in their aid to them. There was a time when meetings called to discuss the question of good roads were not well attended, they were sometimes very miserably attended, and the information we had at that particular time with reference to good roads was to be received largely from other countries; but, backed up by the Good Roads Association, the Government, in the year 1901, appropriated $1,000,000 to be devoted to the purpose of assisting in the work of good roads construction.

One of the questions commonly asked is, "What about the cost?" That is a question which we cannot easily answer, because in building good roads there is no set, definite figure. The cost of the construction of a good road is purely and simply created by local conditions, because the cost of stone might be higher in one locality than in another, and the same thing applies to labor conditions. But there is one matter in connection with the cost that is worth considering. "Whatever is worth doing at all is worth doing well," is a principle which should apply to the construction of good roads. If you don't build good roads in every sense of the word, don't attempt to build them at all. Build them right or leave them alone, because if you don't build them right, while they may last for a short period you will find they are dear in the long run.

The next question you have to deal with is that of road machinery. You can't build a good road without machinery any more than you can build good roads without good material. When the roads in our county were made, machinery had not reached that standard of perfection it has reached at the present time, and we did not have the machinery which we would now have if we were going into a new branch of work. We did not have a roller, which is a very essential feature of good road machinery, for the reason that you will have a ready made road with the roller and save your metal.

Another matter with regard to good roads is the maintenance account. As I have said, if you are building at all, build well, and build a road which has permanency as its basis. We attempted to build the main roads with the money at our disposal. In a County Council everybody must have a piece of the good roads money, and every representative must show cause to bring back to his constituency a certain amount of the good roads money. In our county we built 127 miles of roads, and I say, without any hesitation whatever, that it would have been better had we built probably about 75 miles, because we should have built them better, and the roads would have been more permanent. Last year our maintenance account amounted to between five and six thousand dollars, the year before it was

one-half of that; and so every year added its little addition. First and foremost, the best way to avoid this is to have a perfect system of patrol, the roads should be divided up into sections; that is, a man should be allotted to a certain section of your road. Say, ten or twelve miles just according to your requirements. He should be responsible for that road's condition, and material should be supplied to him so that if there is a rut it can be fixed; if there is a depression, that depression can be filled. For the initial depression probably a few shovelfuls of material would suffice, whereas in a few short months it would require a wheelbarrow of material. These are matters which should be brought to the attention of such a convention as this, so that those who are going into this matter of road building might learn from the experience of others.

I don't pretend to come here and tell you how to make roads, because we have a department in Toronto which would tell you all about it; but I say this, that what information we have in our county relative to the building of good roads, and any mistakes that have been made in connection therewith, should be imparted to you, so that those mistakes might not be repeated.

There is another matter which should engage the attention of this assembly. You do not have any return for maintenance account. I don't think that is right. I think the Government should be prevailed upon to provide sufficient funds, or a fund, whereby the maintenance account of good roads should be supplemented, and not have the county pay the whole. Well, they are spending five million dollars in Northern Ontario for good roads. Old Ontario has paid, is paying, and will continue to pay the shot for a long time to come before New Ontario can take care of herself. While we have paid our share of the million dollars of grant—it is coming out of your pocket and mine, it is our money we are dealing with, and an effort should be made to prevail upon the Government either for a grant for maintenance account or an increased grant for permanent account, making it one half if you will. We do not know what form the Dominion subsidy will take. They have got a complete system in Ontario for handling this particular work. Now, I do not know what is the intention of this convention relative to this matter, but I would suggest that a delegation meet Premier Whitney and representatives of his Cabinet, and urge upon him the advisability of making a fund for maintenance account for good roads.

Another matter which has been brought up in the past is concerning the question of an increased grant towards good roads; whether it should be one third or one half. I think the counties which were the pioneers in the work should be considered and should be given a grant out of that fund, no matter what proportion it is, for the simple reason that what the departments in Ontario now know of good roads, the pioneer counties in building good roads have furnished them with information, and from our mistakes they have learnt. Like all pioneers we have made our mistakes, but like all pioneers we should be recompensed for the work we have done and the information we have imparted to the rest of the province.

I trust you will succeed in the legislation which no doubt you propose to put before Sir James Whitney on this occasion, urging that you have some grant made for maintenance account, and an increased grant for construction, whether it be half or more. We are only spending our own money. They collect from us and they give it back to us, and you will be doing good for yourselves, because it is only a matter of a short time when this Province of Ontario will be a net work of good roads. They have come to see, as the farmers are seeing, the public utility of good roads.

The good road system is having the effect of eliminating the abominable statute labour. That is a consummation which we all devoutly hope for.

I make these few remarks in the hope that those who are embarking on this undertaking will benefit by what little mistakes we have made in the past. We gained our experience and we paid for it, and we give it for what it is worth. We hope that there will be no county in the whole Province of Ontario that will be unrepresented at such a meeting as this. We should work together for our own aims, and for the general good of the grand Dominion of Canada, and if we do that we shall be doing something which will be a credit to ourselves, a credit to our country, and a credit to the flag under which we live. I thank you, gentlemen, for your kind attention. (Applause.)

ADDRESS.

MR. JAMES SHEPPARD, QUEENSTON.

MR. PRESIDENT AND GENTLEMEN,—The gentlemen who preceded me stated that the good roads agitation had been the cause of the abolition of statute labour. That statement was made, and there was no objection taken to it. I believe we all recognize that the statute labor system has done good, and while it served its purpose its day has gone past, yet it is no more fitted for us than are many of the obsolete systems which existed fifty or one hundred years ago.

The County of Lincoln was mentioned a few minutes ago. I was a member of that County Council, and a superintendent of their county roads for many years. A portion of our roads was built in the year 1800, and we have been maintaining a county road ever since. In the days in which I was in the Council the superintendent was allowed from $150 to $250 a mile for the upkeep and the repair of the road, and we succeeded in maintaining a fairly good road.

At the present time the expense of running it amounts to almost $1,000 a mile, and it is torn to pieces by automobiles from the State of New York, Hamilton, and other places faster than we can rebuild it. We know there is a prejudice against the automobile. There are all kinds of remedies and schemes suggested to prevent this state of affairs, but I think we must all recognize that the automobile has come to stay, that it is coming in increasing numbers, and under those conditions we have to make preparation for them, and to build a better class of roads than we have been building in the past.

I live on the borders of the State of New York, and I am well acquainted with their road making schemes, and when I hear of their voting $50,000,000 for road maintenance, I feel that we are rather a small people in comparison with the State of New York, but, as the last speaker pointed out, they had paid for their experience. It is only within the last two or three years they have really been getting value for their money, and realizing what really is a good road. The Park Commission built along the Niagara River a macadam road, and they find it is costing them a large sum of money to keep that road in any sort of repair. From Fort Niagara to Buffalo is being laid down a brick pavement with a permanent foundation, and a surface is being put on it so that in case it does need repair there is the foundation. Under the old system of building macadam roads it was impossible to keep their road in first class condition when it was subject to heavy traffic. (Applause.)

ADDRESS OF WELCOME.

H. C. Hocken, Mayor of Toronto.

Mr. President and Gentlemen,—The question that confronted the earlier pioneers of this country is the one which you are called upon to discuss at this time. I can imagine your forefathers gathering round some kind of corner grocery store and discussing the question of good roads, because the subject is one which has engaged attention, and formed the subject of debate in the Province of Ontario for the last one hundred years at least. But I am hoping that we have reached a time when we are going to build roads in such a way that once they are built they will be built for good, and not have to be rebuilt every few years. (Hear, hear.)

I have been advocating, in a very modest way, the construction of good roads for some years. Since I have been in the City Council, I have found that where there are two or three advocates of good roads Major Kennedy is in the midst of them, and that he is always willing to help in any way he can. I am not like the Major. I do not come forward as an expert witness. I am not able to tell you what kind of road is best to construct. I may say that I saw the particular road the last speaker referred to when I was in the neighborhood of Buffalo a short time ago, and, without having tested it, it has all the appearance of the highest class construction.

As I have said, I am not an expert on good roads, but I came here this afternoon to express the sympathy of this city with this movement, and that sympathy, as you probably know, is not simply indicated by an expression of opinion, because we have expressed ourselves to the extent of $200,000 for the construction of roads entirely beyond the boundary of our own municipality. I think that may be taken as evidence of our real intention and sympathy in this work. We were so satisfied with what had been done for the County of York, that last January the 1st we voted the second $100,000 to carry on the good work, and to-day that work is perhaps a little more extensive, and done in a more permanent manner than it had been done up to that time.

We are told that roads in the neighborhood of Toronto must be of an entirely different character to roads beyond it, and in the neighborhood of smaller municipalities, because the volume of traffic which comes in on the main road is so much greater and so much heavier. That what might be considered a satisfactory type of road in the neighborhood of, say, Newmarket, is entirely unsatisfactory around a city like Toronto. So to-day we are discussing in our City Council not only the improvement of the roads two miles beyond our boundary of a permanent character, but, under the guidance of the Major, we are trying to persuade the Government to join us in building a road forty miles in length—from Toronto to Hamilton—of concrete and of high class and permanent construction. I submit that is about as complete an evidence as you can possibly have of the earnestness with which we are approaching this problem of good road construction in the City of Toronto.

The two factors which have contributed to this result in Toronto have been Lionel H. Clark and the Ontario Motor League, and of the two I guess that Lionel H. Clark is the bigger, for he is the man who, in Toronto, has been successful in developing public sentiment in favour of making larger appropriations for this very laudable object. The Ontario Motor League has also been extremely active, and I don't wonder at that, because I suppose the Ontario Motor League is re-

sponsible for the breaking up of the main roads more than any other single institution in the Dominion of Canada, and it is only fitting that they should endeavour to do something towards the repair of those roads. It is encouraging to see that they are rousing public sentiment, and developing public sentiment to the point where the people are willing to pay, and I hope that they are individually willing to pay their share towards the maintenance of roads of this character. Just how many dollars a horse-power we ought to charge a motor for the upkeep of good roads I am not prepared to say. I would rather leave that to the Hon. Mr. Hanna or the Provincial Government, to deal with; but people who use the main roads to such an extent as do the owners of motor cars should certainly contribute to the maintenance of them, and it should be possible, taking into consideration the number of motors now running, to get a substantial revenue from them for the purpose.

A good deal remains to be done yet, both by the people who live in the county and the individual ratepayers of the City of Toronto, who, I think, will be quite as willing to co-operate towards securing good roads as any up-to-date and progressive municipality on the North American Continent.

In the city we have also to consider the question of paving our streets. That is a somewhat difficult question, and a difficulty which is not so easily overcome as would appear from the city newspapers. We look to the Ontario Good Roads Association to formulate a plan which is sane and reasonable and not too costly, although you will find the people of Toronto quite willing to pay their share.

It is my duty, on behalf of the City of Toronto, to extend to you a hearty welcome. I trust the result of your deliberations will be satisfactory to everybody. I hope you will be able to leave an impression on the members of the Provincial Government and, perhaps, upon the members of the Dominion Parliament, because this is a question which cannot be dealt with entirely by municipal contributions, and it should not be left entirely to municipal contributions. Our Governments contributed $3,000 and $6,000 a mile towards the construction of the railway. Why should not they contribute a proportionate amount towards the construction of the highways—(applause)—because a highway is just as important as a railway, and while railway traffic is increasing very much, highway traffic is also increasing, and the maintenance of good roads is a work which lies very well within the powers of the Dominion and Provincial Governments.

I think I may say, without being accused of being too sanguine, that the Dominion Government has given us a complete and substantial assurance that they are going to take up the question of good roads in a large way. We went to Ottawa last year. We approached the Hon. R. L. Borden and the members of his Administration, and while they did not put up any appropriation in their estimates, they gave us to understand that the arguments we presented to them made a great impression upon them, and we hope that their policy will run along the lines of our request. The resources of the country are now so abundant that our Dominion authorities are able to do it. The ability to pay has always been regarded as one of the fundamental bases of taxation, and we are asking the Dominion Parliament something which they are well able to do, and they are doing it because of the industry and earning capacity of the people—the average man from one end of the Dominion to the other. I do not know where they can begin the work better than in this most densely populated portion of the Dominion, and in that province from which they gain the larger portion of their revenue. We contribute largely, and we expect they will recognize our need of highways as well as of railways. If we can organize in convention form it might be easier perhaps to get this appropriated, but

while co-operative interests are very powerful in their influence upon Governments, there is a still more powerful influence in this Dominion and in this Province. I mean public sentiment. It is only necessary that it should be aroused, and that the people should be united, and when they are, and their claims are reasonable it is impossible for any Government to refuse to recognize this demand. If public sentiment has been strong enough to put great and powerful corporations under restraint, then public sentiment will be strong enough to persuade the Government to do their share towards good road construction.

I look forward to the day when we shall be able to see good roads in every direction, and that the men living on those roads will be able to bring their produce to the city. I don't think that good roads will reduce the cost of living very much; but I think anything that contributes to the ease and comfort of the agricultural population is a most fundamental duty of the Government of the country, because there is nothing, perhaps, that is so difficult to prevent as that lure of the city which attracts the youth from the farm to the great centres. That should be counteracted in the interest of the youth of the city, in the interest of the people, and in the interest of the nation, and to make life easy, comfortable and luxurious upon the farm is one of the steps the Government should take in order to promote the general prosperity of this country. I am glad to welcome you here to-day, and without saying exactly what we will do I can assure you that you have the most cordial sympathy on the part of the government of the City of Toronto. (Applause.)

ADDRESS.

SIR EDMUND WALKER, PRESIDENT OF THE CANADIAN BANK OF COMMERCE.

Mr. President and Gentlemen:

I have been asked to say a few words here this afternoon on the subject of Good Roads, but I feel it is almost a persumption for one who does not pretend to know anything about how to construct good roads to talk to men who have long since known that good roads are necessary, and are more interested in the practical side of it than in the theoretical side of it. However, the Mayor has given me some courage. In my business as a banker I have been a student of industrial conditions in Canada, and have always been interested in what is good for the country as a whole. I have had occasion to say over and over again, at the annual meeting of my bank and elsewhere, that at the bottom of any kind of civilization, not simply industrial, is land transportation.

In this country we have been interested in the larger aspects of transportation. We have three transcontinental railways, and we have built canals which have astonished nations very much greater than ourselves. We have, curiously, already reached a point where the number of miles of railway in Canada, per one thousand people, is the largest of any country in the two Americas; but our country is so big and so thinly populated that, at the same time, we have the smallest number of railways per square mile of any country in North America.

Road-making, in the earliest history of the world, was first performed by the foot of man, trodden by men going from some lake or cave to another, or to the nearest water. When we consider the old civilization of Asia and Africa, we know from geological remains that they must have had better roads than we have now

in Canada for the transportation of their material. If we have any doubt of that we have only to look at Rome itself, which, two thousand years ago, built roads more wonderful than we contemplate building now. That causes us to realize that we are not near the civilization of Rome two thousand years back. There can be no excuse for such a backward condition unless it is poverty.

Poverty has been an excuse for many things in the past, but it is no excuse for a country which has the intelligence and energy, and can afford to do it. Rome not only built roads but she made paths straight to the sea, and connected with her subject tribes in such a way that she held her sovereignty over them. She established the greatest postal system in the western world, and she held her empire together, not by the power of her armies but by her roads. What Rome did in those days must be something worth thinking about. Scotland, in 1600, had practically no roads, but in three hundred years she has constructed some of the most beautiful roads in any part of the world. In 1700 England had roads which were described as abominably bad, and let me say to you her roads were built at that time entirely by the parishes under the Statute Labor System.

England has accomplished a lot since 1700. She tried to improve upon the system of Statute Labor by a system of turnpike trusts, and for one hundred years she made practically no improvement at all, until the Macadam Era commenced, and in the past twenty years she has made more improvements than in all her past history. In Germany they do not for a moment separate in their minds roads from railroads. Railroads are simply roads which happen to have rails upon them, and if we believe in transportation, if we believe that it really is the bone and sinew of our civilization, we should certainly build our country roads up to the level of our railroads. I believe that the farmers, in a comparatively short space of time, will be able to carry their things by traction. We are going to have traction impelled by some sort of machinery, only it will be on the roads instead of on rails.

I do not agree with the Mayor with regard to the effect of good roads on the cost of living. I do not know whether I need say much on that point. To the ordinary cost of the produce raised by the farmer, when he brings his stuff in from the County of York to Toronto, must be added the cost of his waggon, the cost of his horse, their depreciation, his own time. All those items are very real things, and add to the cost of the article which has been raised in the County of York, and it enables the competitor who can pay railway freight to bring things from great distances in competition with the farmer. I am told that a farmer living eleven miles from Toronto travels 18½ miles to come to Toronto; he has to travel 37 miles instead of 22, because of our bad roads. Consequently the farmer is interested in the question of good roads. I do not believe that good roads would ever be built by townships or the county, but only by the Province. (Applause.)

And then we come to the question as to who should pay for it. I am not an expert, but I should imagine that a road such as Yonge Street would be declared a provincial road, and every city and town on that road should pay for the destruction they, themselves, do to the road. I think Toronto should pay a considerable part toward so-called provincial roads leading out of Toronto, because Toronto people do the most towards their destruction, and every farmer who lives on that road should also pay. The county should pay, because the farmers in the county leave their side lines, and travel over that main road to and from the City of Toronto.

I entirely agree that there are roads through this country which ought to be called International Highways, and there is exactly the same reason for the Government to help those as they help the railway. But what we all want is that we should all come forward and say that we are willing to pay our share, if we can ascertain what that share is. We don't want to stand behind each other. We want to go to the Government and say "It is for you to build the roads."

We cannot build roads so fast that it would be a very tremendous financial problem. It is not an impossible financial problem, although a difficult one. The main thing is for the Province to know that we are willing to pay our fair share, if that fair share can be ascertained.

Something has been said about motors. I think, at the present time there are 16,000 or 17,000 licenses in Ontario. If we had good roads in Ontario people would come in in increasing numbers from the United States and travel throughout this beautiful country, a country so lovely that there is no question that there would be such an increase in the number of motors that we should soon be issuing 20,000 licenses for motors—20,000 licenses at $25 each is $500,000, and that is quite a contribution.

Why should we not, as sensible people, get together and say that if the townships share 15 per cent. of the maintenance, and the county will pay so much, the city will pay so much and the province will pay the rest. We all know perfectly well that maintenance is the great problem. It is easy to build good roads, but they are torn to pieces in a short time. The maintenance should be very largely under the control of the province. Whether they do it or not they should have the courage to make others do it. I have tried to put a few thoughts together, and I do say, as business men, we should have no regard for our own pocket, but we should look forward to the prosperity of our country in the future and for the happiness of the children who will come after us. When we establish a system of good roads on a financially sound basis we shall wonder that we have ever borne with such conditions as now exist (applause).

SECOND DAY

Thursday, February 27th, 1913.

Morning Session.

The Vice-President, Mr. N. Vermilyea, in the Chair.

COUNTY ROAD ORGANIZATION AND CONSTRUCTION.

W. A. McLean, Esq., Commissioner and Chief Engineer of Highways, Ontario.

Mr. President and Gentlemen:

During this Session we will consider, more particularly, the future of good roads. Judging from the Speech from the Throne as to the future of good roads in Ontario, whatever we have done in the past we can assume to be only a commencement, but a very good one. I have been over some of the highways of New York State, New Jersey, Connecticut, Virginia, Ohio, Michigan, and others, and while I find that certain of these are superior to our own; yet, comparing the cost, I feel entirely satisfied with what Ontario has to the present accomplished. Compared with these, the people of this country have been given good value for the expenditure.

We do not always realize the extent of roads built in Ontario under the Highway's Act. They are scattered in every county, some in small sections, but which as a rule are being joined up. The roadways constructed under the County Road plan last year, aggregating 240 miles, if placed in a continuous line, would extend from the City of Toronto to Ottawa, a fairly good stretch of highway. If we keep improving in the future as in the past, the prospects are very favourable for a good system of highways throughout Ontario.

Increased Cost of Roads.

During the past few years, the cost of highway construction in Ontario has greatly increased. Highway construction is not made up of the cost of material in the pit, of stone in the quarries, nor by the cost of machinery, but rather by the cost of grading and drainage, of operating machinery, of getting material out of the pit and out of the quarry, crushing and preparing it for the roads and putting it in place. That means that the principal cost of road construction goes into wages of men and teams. Ten years ago the cost of labour was $1.25 for men. and teams could be had for $3.50 per day. I have seen, this year, instances of men being paid $3.00 a day, and teams $6.00 a day, with a fair average over Ontario of $2.50 per day for men and $4.50 and $5.00 for teams, which means that the cost of road construction is practically twice as much to-day as it was ten years ago.

To meet the situation, we shall have to dispense, as far as possible. with horses and manual labour, and turn our attention to road building through the use of machinery. But, to build roads with economy by the use of machinery. we must keep the machinery steadily employed. otherwise interest and depreciation will be too great. and will eat up the profit. In order to keep machinery employed we will have to make road construction "a man's job." We must stop

the annual patching of roads by men and teams, and expand the County Road plan; not to build roads in short, scattered sections, but rather in long stretches, making "a man's job" of the work.

Road Drainage.

Last season one of the striking features of the year was the heavy rainfall, and from all sides we heard that the roads were badly worn. Where our roads went to pieces, under the influence of last season's heavy rainfall, it means largely a lack of drainage; that sufficient precaution had not been taken to put a proper crown on the road, open ditches, and put in culverts where they ought to be. We have to drain in Ontario, not for the ordinary summer weather, but for the heavy rainfalls which come periodically; and for the spring time. The spring time in Ontario, with the coming out of frost and melting of snow, will do more harm to a poorly drained road than the whole of the rest of the year combined, and that is putting the case very honestly. We should drain the highways to carry off the spring freshets and keep the sub-soil dry, so that the stone will not be driven into the soft soil below.

My experience is that counties and their engineers are anxious to do good work; they are anxious to co-operate with the province; and whenever we offer suggestions they are happy to accept and follow them up; and I hope that with the experience we have had in the past, we shall each year see an improved type of highway construction throughout Ontario, in which drainage will be more carefully provided.

We have a standard type of roadway in Ontario. The width between the shoulders is 24 ft., the crown depending upon the width of stone, and varying from half-an-inch to an inch per foot between the shoulders and the top of the road. Below the shoulders, these should be 18 inches or two feet of drainage. The stone in the centre should depend upon the traffic over the road, ranging from 8 to 16 feet wide.

Growth of Motor Traffic.

Some years ago there were prophets who foretold the time when the horseless carriage would arrive, and we dreamed of it as possible only in Paradise. But the automobile has come, and we have not yet found the Paradise. In fact, throughout the townships, I hear quite the opposite at times. (Laughter.) Ten years ago I would have gone two or three blocks out of my way to see an automobile. To-day, walking to my office, at one street intersection, I was chased by about six of them, and felt like running several blocks to get away from them. That is the change in the ten years past. My view of the case is that within the next ten years the automobile, or the principle of it, applied to country transportation will be found to be one of the most useful implements, one of the best friends the farmers of this country have yet had. I realize fully the present inconvenience of the situation, but with a view to the future, believe that country councils should build thoroughly good macadam and gravel roads.

Local Benefit and Assessment.

Everybody wants good roads, but few want to pay for them. They do not want to pay for them with half the zeal with which they ask for them. It is extremely important in entering upon any scheme of construction to have an

equitable system of distributing the cost. The people of this country will not object to pay a reasonable price for good roads if the cost is equitably placed upon those who should pay for them. My experience is that, while the people at the commencement are often opposed to good roads, when they begin to see results, they say "That is the road we want, and will pay what it should cost."

The increase in the price of property along highways which have been recently constructed indicates the real service good roads are to a country. We talk about the service good roads do socially, commercially and otherwise; but getting to practical dollars and cents, we find that property along a good road is increased to the extent of $500 to $2,000 for each one hundred acre farm. Increase in the value of property is a pretty good indication of the service these roads are to the people of the country. Just think what that means. Every one hundred acre farm is increased in value to the extent of $500 to $2,000. With eight farms fronting on each mile of highway, it means an increase of from $4,000 to $16,000 per mile of road. With that increase, property can pretty fairly be assessed for the cost of a great portion of the roads. When you take from that cost the proportion the Province is paying under the Highway Improvement Act, it looks like a pretty good proposal for any part of the country to construct good roads.

It is often said that the people who are receiving the greatest service from the road, and whose property is chiefly increased in value, should pay a larger amount. That is true, and to give fair play the assessor should increase the assessment of the property along the improved highways.

The question of frontage, or area tax, is also spoken of. I believe that to be fair also; especially in cases where the increased value of property adjoining those roads will be very great. For instance, in proposing the construction of a main highway between Toronto and Hamilton the people along that highway have said "If you will construct it, we will pay an annual frontage tax of one and a half cents per foot for thirty years." That is strong proof that those people believe the increased value of their property to be such that they can pay a frontage tax to get the road. The people on that highway have consented to the plan, and it indicates that the principle, if extended and made applicable to certain other of the most important highways, could be serviceable and acceptable, and would help to create the fund necessary to construct good roads.

It is also argued, and very properly so, that the automobile should be specially taxed. I will not go into the question of the destruction of the roads from the use of automobiles. They unquestionably do considerable injury to the highways, especially heavy cars which travel at high speed over stone roads. But it is a notable fact that the automobile owners have consented to pay such a tax; which will no doubt be imposed.

What the Cities are Paying.

It is said also that the consumer should pay, which is absolutely true. The people of the towns should help to pay for main roads. What are they doing in Ontario at the present time? The townships, we will say, pay two-thirds of the cost. They receive one-third from the Province. Now the population of the towns and their assessment throughout Ontario is practically equal to the population and assessment of the townships; therefore, I take it that the people of the towns and cities are paying one-half of that one-third, or one-sixth of the cost of the good roads constructed under the Highway Act at the present time. One-

sixth, I think you will agree with me, is not sufficient. There should be an increase. Just what that should be I will not discuss to-day, but it will have to come eventually.

The County Road System.

The Highway Improvement Act has been before the people of Ontario for some time. For over ten years, counties have been offered one-third of the cost of constructing main roads, and all of them have not yet jumped at the chance. I do not know just why they have not. There is a story told of Spurgeon, who was holding a revival meeting. He asked those in the audience who wished to go to Heaven to stand up. They all stood up except one, a sailor. Mr. Spurgeon asked him why he kept his seat. "Don't you want to go to Heaven?" he enquired. "Not with that crew," was the reply. (Laughter.)

What there can be about "this crew" as instanced by the Highway Act I don't understand. The Highway Act, is extremely simple in its operation. The County is empowered to take over and maintain the main roads of the county highways used by the people of that county, and serving the market requirements of the people of the county. They appoint their own Superintendent or Engineer to direct construction for the county council. At the end of the season they send us their statement of expenditure and we pay them one-third of it. Up to the present time we have not had any serious trouble with any county. Sometimes they say we are a little slow, but we get there just the same, and they always feel sure of their cheque. The County Council controls these main highways in the same way as a Township Council would manage their roads. By concentrating our efforts and energies on a special system of highways, we follow a principle that is absolutely essential in any similar form of organization. In any line of construction you must concentrate sufficient energy on a fixed object to accomplish that object: to complete it and then go on to the next.

Road Organization.

I have referred to organization. Organization, I am convinced, is the keystone of the situation. If you get your organization as it should be, everything else will take care of itself. All the people of Ontario will not have to be experts in highway construction, nor will every county councillor be an expert in road building. They will select a Superintendent, or Engineer, to act for them and he will become the expert in this line of construction. The Superintendent, as I understand, should practically take the place, with the county council, of a contractor. He should be the type of man who would be a successful contractor. One of the important duties of a county council is to select as their Superintendent a man who will have that degree of individuality which will make him stand out as the head of their county road system, and to whom every foreman and other employee on it will look with respect. That, I believe, is being accomplished throughout Ontario to-day. The County Councils are looking for the best type of man to occupy this extremely important position.

Another important part of the organization is the foremen. Part of the qualification of the superintendent should be that he is able to select and get to work for him, and with him, good and capable foremen. What is a foreman? The word 'foreman' explains itself. It means the first man; the head man on the work, carrying out the instructions which have been given to him, and whose special duty it is to get the men, the teams and machinery to give fair and honest

service on the road. Between the superintendent and the foremen, you have the essential features of an organization, and too much care cannot be taken in the selection of these men.

When you have selected the superintendent (to take the place of a contractor), you must give him corresponding authority, otherwise you cannot hold him responsible. You cannot tie a man's hands and accuse him because he does not work. The superintendent must, according to the measure of responsibility placed upon him, have an equal degree of authority in handling the organization that he is expected to control.

A part of your organization, and an extremely important part, is to plan. A friend of mine, a contractor, has a foreman who is a Bulgarian. My friend said to him recently, "Peter, are you going home to help your country in the war?" Peter said he belonged to the third reserve, and would not be called out. My friend said to him, "How is it that your little country of Bulgaria has accomplished, in about three weeks, what it took Russia almost a year to do in the time of the Crimean War?" "Why," Peter said, "that is very simple. For years my country have had hundreds of officers going through Turkey, making plans of every part of it. They know Turkey just as you know your back-yard."

So when you undertake to build highways you must plan ahead; and get the plans perfected, as far in advance as you possibly can. It is part of the duty of the superintendent to plan his work; and every foreman should be the first man on the job, with the day's operations well planned. Not only should the superintendent plan for carrying out the construction, but the foreman should come to his work each day with a clear understanding of what he is going to do. These are some of the features of the organization that we should try to build up. In planning our work we should plan adequately, and be able to accomplish what you have in view.

Contract vs. Day Labour.

I am sometimes asked if it would not be well to construct roads by contract instead of under the county road superintendent and his foremen. In road construction, in my experience, in order to get as good results from a contractor as from your own foreman, you must spend too much on surveys and engineering supervision to get the contractor to carry out the work. Specifications must be so complete that they frighten the contractor and increase the amount of his tender. The contractor's risk is also greater than that of the municipality. I have seen sections where contract work had been carried out very close to day work, and going over those two sections, we could point out the parts which had been built under the county superintendent and those under the contractor. The time is approaching when, I believe, we can construct highways by contract, but for the simpler class of work, the best and cheaper results will come through carrying out the work under the superintendent and foreman. When we come to make Provincial highways such as are constructed as State Highways, I can understand where the plant of the contractors can achieve excellent results, and his organization can be made of good use. But, up to that stage, I believe that the best and cheapest results can be obtained by doing the work under your own superintendent.

Freight Rates on Stone.

It is important to get stone, in a great many parts of Ontario, as cheaply as possible. There are parts of the Province where there is plenty of stone; where

the people would like to exchange it for some of the good soil of Essex County and Elgin. Down in Leeds and Frontenac there are points where they have so much stone that they do not go off the highway to procure it. But in certain parts of Ontario the only way we can build roads is to ship stone by rail. That is expensive; and there has been a feeling among the counties that the freight rates ought to be reduced. I believe so, too, and we have placed the matter before the Railway Corporations from time to time. The last negotiations entered upon were the most hopeful I have yet undertaken, and I hope we may be able to get the freight rates on stone reduced. But we cannot control two ends of the string at the same time. The point has been raised that if we get the freight rates reduced, we are merely creating an opportunity for the quarry owners to increase their price for stone. If we can in any way get the cost of hauling the stone reduced, we shall expect you to look after the other end of the problem.

Township Organization.

"Township organization" was on the programme for to-day, but has not been taken up, and I would like to say a few words with regard to it. The construction of County Roads in Ontario does not end with the construction of main arteries. One of its objects is to free the township municipalities from the annual cost of maintaining their trunk roads. As I have intimated before, roads must be constructed and maintained for the traffic over them. I was talking not long ago to an officer of the Roads Association who has had a great deal of municipal experience. He instanced a road leading into Yonge Street gravelled about ten years ago. They made only a fairly good road of it. Since that time very little had been spent on it, but it was always good; whereas Yonge Street, into which it fed, had in that township received $2,000 every year to keep it in but an inferior degree of repair. That is an extreme illustration; but it is the fact that in every township, if you have not good main roads at the present time, as soon as a good road is constructed, it becomes a main highway, it draws the heavier traffic from other roads. From this cause, townships can construct an inferior type of highway for branches from the main road, which will serve equally as well the traffic over them. My view is that every road in Ontario, travelled to any extent, should receive a due degree of care, and by proper organization in our townships, this can be done.

To get a system established in the townships, there are some essential steps. One is that you place your system on a cash basis. Collect what you require as a special levy on the assessment of the township, what your people can afford. When that sum is a sufficient amount, say $3,000 or $4,000, you should have a foreman appointed under the township council to take charge of the expenditure. By starting early in the year, he can, with the grading machine, grade the roads at the time of the year when earth is in a suitable state to be handled. We often see grading in progress on clay roads when they are as hard as bricks. That is a mistake. Road construction should go on at the time of year that is most suitable. The foreman should be out early in the spring as soon as the soil is fit, to do all the grading that is required for the year. By using the log-drag on the roads after grading for maintenance, you do not have to repeat the grading operation and it becomes permanent. But the log-drag is useful only as you make it part of a system, and the organization of that system ought to be the duty of the township foreman. After the grading of the year is done, when the streams are low and the ditches are dry, that is the time for him to build the small bridges, and

culverts. Gravelling, if there is gravel in the township, can be let by contract, and carried in when the grading is finished. In the fall, drainage should be completed. By employing a permanent foreman, you create in him an experienced employee who will be able to bring that skill to play upon your highways such as other countries have found necessary.

Ontario should be famous as a country of good roads. We have a most enviable position on this Continent. We are placed at the heart of it. Railway communication leads in every direction, and by our waterways, canal, river and lake, we have immediate access to the ocean. Surely that is an enviable position. We have one of the finest agricultural sections on this Continent, the climate can scarcely be excelled in any part of the world, and with such means of transporting our products, surely we live in a country which deserves good roads. When I compare Ontario with England and the older countries, the first distinction I see is the character of the roads. If the Province of Ontario wishes to reach the stage those countries have attained, at the basis is the construction of a system of good highways that will enable us to make use of our great natural heritage.

ADDRESS.

DR. C. O. FAIRBANKS, PETROLIA.

Mr. President and Gentlemen:

I wish to congratulate Mr. McLean on the very able address he has given us. He is an expert, and I think the Province is very fortunate indeed in having such a capable engineer at the head of affairs. I also wish to congratulate the Ontario Good Roads Association upon their turnout to-day. It is gratifying to see such a tremendous interest being taken in Ontario in this very important subject of good roads. The Province of Ontario cannot be beaten on this continent. We know that it is particularly desirable that the highways which traverse this county should be in the very best shape.

This is an age of system and organization and co-operation, and in the County of Lambton, before launching into a road scheme of magnitude we proposed to apply them to local conditions, and a short time ago we formed a good road organization for that purpose. I have been a member of the County Council for a number of years, and this question is often discussed. As you know, county councils change. You may formulate a plan one year and bring it to maturity, and the next year a new Board of Councillors come in and the work has to be gone all over again. To obviate this and get the thing in better form we proposed to form an organization.

In the Town of Petrolea they invited delegates from all over the County. Those representatives came and formed a Good Roads Association. They went to the County Council and explained their object, obtained a small grant, and they are proceeding along the lines of information. Like everything else the making of good roads is a business proposition.

Mr. McLean has said that everybody wants good roads, but that everybody does not want to pay for them. If you want good roads you have got to put your hand in your pockets and pay for them. The first thing to-day, in each section, is to study the particular conditions. What is adapted to one section is not

adapted to another; you must tabulate the information, get out all your details, lay out your plans, and then proceed in a business-like manner. That is what we are attempting to do at the present time in the County of Lambton.

The first thing to do is to lay out the particular highways which need first attention. In Canada, where the population is not very great, the question of big trunk roads does not appeal to us. The chief thing is to get the produce to market, and we suggest laying out the roads radiating from the various centres, and commence our construction from each market point. I think that would be a good plan for every County to take up. A Good Road Association should be formed in every County, and by a union of these Good Roads Associations we can formulate a plan. We want to decide definitely what we want; formulate a plan for going to the Government and we shall eventually get the system in proper working order. Gentlemen, I thank you.

TECHNICAL COURSE IN HIGHWAY ENGINEERING.

A. T. Laing, Esq., Toronto University.

Mr. President and Gentlemen:

I appreciate very highly the opportunity of saying a few words to you in reference to the work we have undertaken at the University in connection with the cause which I am sure you are all interested in. I may just point out a little of the history of the Institution from which I come; the Faculty of Applied Science, formerly known as the School of Practical Science. As most of you know, Professor Galbraith has made as his life-work the training of men for the engineering field, and I think the history of the Institution goes to show that his life has not been spent in vain in this connection. The effect of his training has gone throughout the entire length of this land.

Fore some years the dean has been deeply interested in highway work, and some years ago there seemed a promise of establishing on definite lines an Institution of this kind, but circumstances prevented carrying it out. I am glad to tell you that work has been mapped out on lines similar to a number of other Institutions on the continent in giving a course of training which will fit men for the very important field of highway engineering.

I am quite sure that the importance of a technical course of training to men for this field of activity must impress itself upon every person who is interested in the work. There are few branches of engineering activity in which a greater demand is made upon the resources of young men. One comes across conditions so widely varying as to tax us to the limit in dealing with them. There seems no reason why $100,000 should be spent on a highway in the mere hope that it might be required, than that you should build a bridge at a cost of $100,000 on the same assumption; in the hope it might serve the purpose for which it is built. It seems that this must impress itself, because the problems involved are such that it will tax the treasury for the proper construction of roads to meet the demands. The ever changing physical conditions with which the engineer has to deal, necessitate that he should have some knowledge of the geological construction of the earth's crust and of the nature of the material with which he might have to deal, of rocks and road metals to be employed in road construction.

He should be a competent surveyor, able to make a plan of a proposed road, to suggest where a change should be made in alignment, to make a thorough survey and to make his plan show the profile; to be able to arrive at an estimate of material to be handled. Besides that he will have a good deal of demand made upon him in other branches of engineering. He should know something of hydraulics, be familiar with the question of the flow of water and open channels. He should know something of machinery. There is a large amount of machinery in construction work, and a full acquaintance with the principles of machine operation is required of him. He should know something of the strength of material with which he has to deal. He should have a knowledge of bridge engineering which is a most important feature of his work. He should know something of masonry and re-inforced concrete, because he will be constantly called upon to employ all those features of engineering. He should know something, and the more the better, about the chemistry of materials that are employed, particularly along the line of bituminous materials. He should know something of the laboratory methods in conducting investigations in materials with which he has to do, and he should be able to interpret results in disposing of the problems which lie before him.

In addition to this course of instruction, which is purely technical, he must, to become a highway engineer, have a very wide field of experience, and, certainly, the more of it the better. It is not the intention at the University to establish a separate course, as is done in some branches of engineering with which we have to do, but to make it a portion of the Civil Engineering course. Nearly all those features I have mentioned as being essential are in our regular engineering course, so it would not be necessary to form a separate course for this purpose.

It is not considered good practice to encourage specialization by young men who have come into the engineering colleges too early in their course. We do a certain amount of specialization. We have mining, civil and electrical engineering courses. To that extent we have specialization. A man may confine himself entirely to Structural Engineering, in which he is dealing with problems of steel construction. He has a course in astronomy, and he may proceed to work on surveying and the advanced line of work in surveying. We have other courses, and amongst them we have established a course in Highway and Sanitary Engineering, or what may be called a course for the men who propose to become Municipal Engineers.

We have a course of lectures on roads and pavements, their construction and maintenance, and a laboratory course in the testing of materials commonly used, and we hope to add to our equipment from time to time. At the present time we have an apparatus for the testing of the value of materials used in construction, and although the days of water bound macadam seem to be over, yet we are not prepared at the present time to dispense with it. We have the abrasion test for determining the resistance of stone to metals. In addition to this we are adding to our equipment, apparatus for the testing of bituminous materials. All of this you can readily see must add to the experience that can only be gained in the field.

We do not propose to turn out Highway Engineers. You may wonder at that statement. But we give them a training by which they become Civil Engineers after they have left us, and those who come to take the course as we have prescribed for Highway Engineers must become such after they have left us.

And here is just the point where I feel that the University and your Associa-

tion can come together in assisting to qualify men who must undertake these large problems with which you are to be confronted in the future. For myself I should be glad to lend any assistance I can towards promoting the interests of your Association, and the general interests of highway construction or investigation, and so far as I am able to do can promise that the University will be glad to co-operate with your Society along those lines. (Applause.)

AFTERNOON SESSION.

THE CHAIRMAN: It seems to me that we have reached the most important question which should come before this Convention. How are we going to get the money to improve the condition of the roads in this Province? How are we going to deal with that question between now and the date of the commencement of the Ontario Legislature which will take place two years hence. I will read the Resolution, and I ask that it be referred to the Committee on Resolutions. I do not know how you feel about it, but as for the Counties I have knowledge of, the roads are distinctly worse than they were two years ago, and the cost of road building has been greatly increased by the weather conditions. During last year I do not think that there were more than sixty per cent. of the days on which men could work, or could possibly do anything at all. On many days during the summer the men would begin on a road and would be driven away by the rain, and the roads were left in such a condition that it was impossible to do anything with them. They were in almost an impassable condition. We were not to blame for those conditions, and we cannot bear the result either. The counties are not financially able to bear the burden imposed by the conditions I have recited, and I think we ought to impress upon the two Governments that fact, because both Governments have an over-flowing Treasury. I believe they are both willing to contribute.

I think that one of the gratifying features about this Association is that there is not a particle of partisanship in it. These men are the men of the people, no matter to what party they belong. (Applause). We must ask the Government to contribute more largely, and if we ask them I have no doubt they will supplement their contributions next year. They ought to contribute at least one-third towards the cost of roads and bridges, because of the weather conditions.

ROAD MAINTENANCE.

DR. L. I. HEWES, ENGINEER IN CHARGE OF MAINTENANCE DIVISION, U. S. OFFICE OF ROADS, WASHINGTON, D.C.

Mr. President and Gentlemen:

When I was asked to come here and speak to you, I looked up the reports of the Ontario Highways Department, and remarked, after reading those reports, that a man must have a good deal of courage to come to Ontario to try and tell you anything about maintaining roads when there was so much information in those reports. If I repeat a good many things that are said I hope you will pardon me.

The primary defect in road repair and maintenance to-day is lack of business management. The management of road construction is slowly improving, but repair and maintenance continue neglected. There is a certain enthusiasm and interest about new work which is entirely lacking for repair and maintenance operations. It is now well recognized, however, that no system of roads will remain a good system unless continuously cared for.

It is necessary to distinguish between repair and maintenance. When a road is finished, traffic and the elements act continuously to deteriorate it and will ultimately destroy it. To oppose such deterioration, maintenance equally continuous is required. If maintenance is neglected the best roads will very soon require repair and longer neglect will even require reconstruction. It has been customary for a long time to classify repair as maintenance. It is a natural mistake in view of the fact that, generally speaking, roads on this continent have not been continuously maintained, and therefore if maintenance is referred to, it necessarily signifies repair.

Under the organization which prevails throughout Canada and the United States, town and county roads are largely in charge of local officials elected at short intervals. Road management constitutes, as a rule, only a part of a miscellaneous list of duties. Consequently local officials are not elected because of their skill in road making. The typical road official has abundant confidence in his ability and usually proceeds to try out his ideas at the expense of the community. He has his own definition of gravel, crown, grade, etc., and usually has spent considerable money before he is willing to seek advice: and then it is time for electing a new man. Now, any system in business where an executive officer was dismissed as fast as he learned his duties would be unhesitatingly condemned. Why do we continue to use such a system on our highways?

The difficulty is largely because the local civil unit for highway purposes is too small. Too small because the annual appropriations for highways do not warrant the employment of skilled supervision; too small because with the permanent practice of rotation in office the annual appropriation is handled by each official as *his* appropriation without reference to what has preceded or what is to follow. Too small because the experience in road construction and maintenance does not cover a wide enough range to supply information which already exists beyond the borders of the local community. The remedy for this condition, which so universally prevails, is co-operation in some of its various forms. A possible form of co-operation is for townships to collectively organize road districts and hire a salaried road engineer. Another possible form is to delegate more authority over local roads to county officials and to require a high class county engineer. A still more effective form is to invite co-operation from the state or province, even in the matters of township roads, as well as in county roads and inter-county roads. It has been done in the State of New York.

You will observe that all of these methods suggested involve more centralization in the matter of roads. If there is objection to such centralization, the answer must be that there must then continue a "road problem," for an actual study of the scant records that have been kept on the cost and method of earth road work always reveals the startling fact that enormous sums of money have already been spent under the old system without visible improvement in the roads. I do not hesitate to condemn the use of statute labour upon highways. It has never proved effective. There are several fundamental objections to its use. First, under the statute labour system, work upon the roads cannot be, in any sense, continuous.

Neither can it be applied "in point of time." Second, the attitude of freemen toward such work is careless and indifferent and the days of working out the taxes are too often regarded as more or less of a jollification period. Statute labour is not economy even for those who advocate it strongly. For those who advocate it strongly are residents who see in the custom an opportunity to avoid cash payments and to discharge a duty to the community with a minimum of effort. Now, the dwellers along the roads are the ones to use the roads and in proportion as the repair and maintenance of their roads is poor, so is the transportation burden per ton mile of useful produce increased. Those who advocate statute labour in preference to cash taxes simply shift the payment of a road tax to the payment of a mud tax. The road tax is a definite sum of cash, the mud tax has the never-ending invisible burden on the cost of hauling.

Let us consider then the repair and maintenance of a typical well organized county road system. In the first place, there should be a map of the county showing plainly all the roads within its borders. These roads should be classified. A possible classification is market roads, through roads and neighborhood roads. Necessarily many market roads will also be through roads and usually every through road is in part a market road. When the roads have been classified according to their service, there should be indicated the nature of construction on the already improved portions in each class. By consulting records, the average annual appropriations for all road and bridge purposes for a series of years may be determined. It will usually be found that some of this money has been spent for a new work but that a large percentage of it must go for annual repairs. The County Highway Engineer or other Highway Engineer in charge of the road system must then adopt a financial plan not for one or two years but such a plan as will, within a series of years, result in a general betterment of the highways under his jurisdiction. A certain large percentage of the roads will receive a minimum of expenditure proportioned according to their importance. These roads will, many of them, be neighborhood roads which serve, in many instances, but one or two families. A plan of improvement for the market roads should be adopted and a strong maintenance system established for all improved roads and especially for the important roads which must wait for improvement.

The order of improvement to the relatively small percentage of most used roads should be definitely determined and the type of improvement should be carefully planned. In making such plans, it must be understood that the first mile of any highway radiating from a market centre receives an annual traffic many times greater than a mile of the same road which is six or seven miles away from the market. Therefore the type of improved surface adopted near the town must necessarily be more expensive than that adopted on the outlying mileage. A great deal of permanent improvement may be brought about on earth roads by the expenditure of the money which is usually classified under annual repairs. The engineer should first determine the existing profile of such roads and establish a grade line toward which some work may be done each season. The necessary improvement of the culverts, such as replacing wooden and other cheap construction by more durable construction such as concrete, should be planned so that some permanent piece of work may be done each year and the whole effort should be to produce ultimately a road which may be adapted to this service and which shall require low annual repair and maintenance charge. You must see that no such scheme of work can be planned and carried out by any road official who sees only the expenditures of one year ahead.

To get a little nearer to details, there must be begun a systematic set of highway accounts. All operations of repair and maintenance as well as construction should be classified as grading, ditching, repairing culverts, dragging, etc., and the unit costs of the various items must be obtainable from the records. To accomplish such a result, distributing tables may be printed on the backs of warrants and vouchers for labour paid. A great defect in maintenance and in repair has been the unintelligent management of materials and machinery. If a macadam road is to be maintained, there must be a supply of No. 2 stone stacked in considerable quantity at intervals along the road. The hauling of this material should be done at the most economical season of the year and it should be continuously available for small repairs. The same applies to gravel. A great many roads may be constructed successfully and maintained as gravel roads with good results. For this purpose the location of the sources of supply of gravel and gravel pits should be plotted on the road map and a record of the quantity in each pit be kept. Very frequently gravel is hauled necessarily great distances for various insufficient reasons. Too often the owner of the gravel pit is also managing some of the roads and may prefer to haul a mile or two from his pit when there exists a supply of good gravel within a quarter of a mile of his job. There is frequently, however, good gravel handy to work, but which has never been discovered or developed. It will pay to make a most careful investigation of the sources of gravel supply along every road.

With reference to the repair of earth roads, the custom of scraping sod and refuse of all kinds into the road centre with a scraping grader cannot be too severely condemned. It is a universal cause of bad roads and waste of highway funds. In repairing an earth road with a scraping grader, the sod may first be scraped off and carted away or the sod may be raked off or picked out with forks and carted away, but never should sod or rotten leaves or manure or any organic substance be placed on the road. The operations of the road grader have been positively damaging in some cases. Many country roads have gutters that are too far from the traveled way and the road supervisor runs the scraping grader a little outside of the wheel tracks to form a new gutter which wanders in and out and up and down and has no outlet. The cost of operating a scraping grader with from two to eight horses attached is very great and unless very effectively managed is a source of tremendous waste. Where new gutters must be formed, lines must be run before work is commenced and broad shallow outlets should be constructed through the turf at all low points and all intermediate points on hillsides. Frequently the repair operations with a road grader can best be accomplished by scraping old material off the road toward the gutter and carting it entirely away. A great defect in most country roads is a high shoulder just outside the wheel track. The road grader can be used effectively to lower the shoulder by beginning at the wheel track and working in successive trips toward the gutter. The earth can then be moved to the centre of the road more quickly and without moving a constantly increasing mass. Very frequently the blade of the road scraper is run too deep at the gutter and not deep enough upon the shoulder.

When an earth road has been put in repair, it can be maintained by the road drag. The original form of the road drag was a split-log drag made from the split halves of a six to eight foot log, six to eight inches in diameter. The two halves of the log are placed face forward and are set two and a half feet apart and at an angle of 45 deg. to the axis of the road. They are suitably braced and

supplied with double-trees. In using the split-log drag, two horses are usually needed. Dragging begins at the outside edge or the gutter line of the earth road and proceeds towards the centre. The effect of the drag is to pair off ruts and move a small quantity of earth toward the centre of the road. It also has the capacity to puddle the surface material and form more or less impervious layers which prevent moisture from soaking into the road bed. To drag a road twenty-four feet wide will require three round trips. A team of horses can draw a drag in ten hours about twenty-four miles, so that with three round trips, about four miles of road can be dragged in a day. This is probably the maximum. On steep grades or with unfavourable conditions, such as irregular gutters or stones in the road, the performance will be less. The minimum cost figured on a four mile basis depends on the price of a man and team; at $4.00 a day, a complete dragging for three round trips is $1.00 per mile. In the experimental work by the U. S. Office of Public Roads in Alexandria County, Virginia, the cost of dragging has been about $1.25 per mile of three round trips.

The first year of dragging an earth road will require a greater number of trips than in subsequent years. Possibly 24 draggings will be required. As the road gets harder under continued draggings and traffic, fewer trips are needed. Important problems to determine immediately are how to establish the dragging system. Probably the best way will be, for the present, for road officials to contract with men who live along roads to drag sections from two to four miles in length. The dragging should be done after every rain and the section men may be required to fill out and forward to the supervisor a post card for each day of dragging. As time goes on, it may be possible for many communities to combine the road patrol and dragging system. This will require the continuous employment of men for probably seven months in the year. If they are paid $45.00 per month with the understanding that they are to do all dragging, when necessary, the annual cost will be $31.50 per mile on a ten mile section. This is not an excessive cost per mile. It would no doubt pay to establish such a system in those counties which are spending around $40.00 per mile on any considerable mileage in the community. The presence of the patrolman during storms to prevent erosion and keep drainage in working order is a great permanent benefit to the road. In the experiment by the U. S. Office of Public Roads, as above referred to, about 43 per cent. of the patrolman's time was devoted to repairing, cleaning and improving ditches and under-drains and 23 per cent. to dragging. Whatever system of dragging or continuous maintenance is adopted, and the continuous maintenance is the best system, there must be competent inspection of daily reports to the inspector.

On the continent of Europe, the road men are frequently supplied with written instructions covering the slightest detail of their work. There is no reason why such a system could not be adopted on this continent. There is need for written instructions covering a great variety of details. For example, the care of the road at driveway entrances, particularly on hillsides, is extremely imperative to prevent wash from adjacent lands. This is also true of road intersections.

With reference to the method of maintenance of macadam, gravel and bituminous macadam roads, there is much to be said. Written instructions should be issued covering all such points as the selection of stone, the preparation of worn holes and ruts to receive repair material, sweeping, scouring and picking up of the old road, etc. Wherever a roller is present there should be instructions

to roll all macadam roads in the spring as soon as the frost is out. The management of the hauling of gravel and broken stone, the balancing of men and teams, offer a great opportunity for economy, and detailed instructions on such matters are not superfluous.

It is scarcely necessary to add to what has been said above that the repair and maintenance of our highways is a business which requires trained men for its management and skilled workmen for its performance. There is no need to argue and waste oratory over the road question longer. We know it needs business management and we know that it costs an excessive amount of money under the old system. Furthermore we know that the roads do continue poor. Happily it has been found that all road work responds amazingly to organization and skilled supervision, nor is it necessary for a general election or over-hauling of official positions to make a beginning in the improvement of repair and maintenance operations upon our highways.

ADDRESS.

HON. J. O. REAUME, MINISTER OF PUBLIC WORKS.

Mr. President and Gentlemen:

I have watched carefully the progress of road making in this province, and I must say that I congratulate you, and I welcome you to this city as men inspired with good public spirit and enthusiasm, men whose work in this province will redound to the great benefit of the people of Ontario. We often open up the pages of history and read of those great men who have distinguished themselves on the field of battle, or those great politicians who have made a great speech, but I want to tell you that the men who have devoted their time and attention to better conditions throughout the length and breadth of this province are as worthy of figuring on the pages of our Canadian history as those politicians who spoke a great deal and who didn't say much. (Laughter.)

Two years ago I had a good many ideas in my mind, but they were not ripe enough to be developed. I am glad to say that to-day we are on the fringe of having those promises fulfilled. As you know, the Address from the Throne this year at the opening of the present session stated what it was the intention of the Government to do in regard to this propaganda. We intend during the recess, either through a commission or by some other means, to investigate with regard to location and material and the kind of roads that are wanted in different sections of this province, and to go on with the work from year to year, until we can compare favorably with other countries having good roads. (Applause.)

The amount was placed at five million dollars. That is very small. It will require a great deal more than five millions, and it behooves the Government which undertakes such a task on behalf of the people to be very careful with regard to the preliminary steps in order to end right. We fully realize that in various sections of the province there are various roads that may be used. In one county a good gravelled road, well drained, well crowned, and well maintained will meet local demands; whereas in other parts a fairly well kept up macadam road will answer the needs. But there are other sections, such as between Hamilton and Toronto, or between Hamilton and Niagara Falls, which cannot be so easily served. I had the extreme pleasure this morning of listening to a delegation from some point

between Hamilton and Niagara Falls, and they very truthfully made out a case to me that although they built a road of Macadam some years ago which was ample for their needs it was now of very little use. This is the age of the automobile, and they are increasing rapidly. There is more heavy traffic travelling over the roads at the present time than was ever anticipated at the time they were built. It is the people from New York and from Toronto and elsewhere who are using the roads, and the time has arrived when we should make another standard of road, when we ought to consider, perhaps, the building of permanent roads in certain sections of the country.

I want to tell you, and I speak on behalf of the Government of Ontario, that we fully recognize the good service of this Good Roads Association. It has been my pleasure always to assist in a grant every year to defray its expenses and in printing its reports and sending them broadcast. You have been instrumental in raising the enthusiasm of the people in this work, and I want to let you know that you have my hearty support. I am sorry I have to go. I hope your meeting will be successful and productive of the good that it has been in years gone by. What I would like to see is less people, perhaps, at the annual meeting, but more meetings held throughout the summer and winter in the various counties where the people need education and need to be inspired for their welfare and benefit.

You have a lot of men in your association fit and qualified to go to the neighboring counties and discuss these matters. They are of the greatest importance. We have been doing something this last year. We have inaugurated a new system of starting a few samples of roads as object lessons for the people where they have not taken up the question of good roads. We are progressing; we have made some forward movement since last year, and that is only the beginning of what we are going to do. I thank you. (Applause.)

ADDRESS.

JAMES L. TAYLOR, COUNTY ROAD SUPERINTENDENT FOR WENTWORTH.

Mr. President and Gentlemen:

I want to relate some of the experience we have had in Wentworth in the building and maintaining of our roads. We started building our roads in Wentworth eight years ago, and we probably made a great many mistakes in the way of construction. I know we have built roads in the past in a way that we would not recommend they should be built in the future. We had to feel our way. We started out with an eight foot road. We found that a mistake, and for this reason. The roads near the city would have to bear twenty times the traffic than those in the outlying districts, and consequently our roads near the city suffered from the want of proper maintenance. A little later on, after having discovered our mistake, we undertook to widen our roads near the city. One road we widened to sixteen feet. In building a road I would advocate the building of it wide enough, and with crown enough, to maintain all your traffic.

The roads which were built eight feet wide fifteen or twenty miles from Hamilton are standing fairly well. We gave them a good crown of one inch to the foot, and we find that those roads in the far end of the county are standing fairly well. The roads near the city should be about sixteen feet wide. The cost of maintaining

our roads has been three to four hundred dollars a mile for the last three or four years. In 1911 the maintenance of our roads cost $36,000, and in 1912 $37,000, making, on an average, a little over $200 per mile, and I might say that most of the maintenance was within five miles of the City of Hamilton.

To-day there is a pressing need for good roads, and while we advocated last year a concrete road we have done nothing in that direction yet, but I hope in the near future that we may. I should like to see a movement started to construct a concrete road from Toronto to Hamilton, and I should be pleased to see one constructed from Hamilton to Niagara Falls. Good roads have come to stay. Automobile traffic is increasing, there is no doubt about it that automobile has also come to stay, and we shall have to provide roads to carry the traffic. We cannot carry that traffic unless we build something stronger than the ordinary Macadam road near the large cities. In the outlying towns one might get on very well with a Macadam road.

STONE AND GRAVEL ROADS.

By E. R. Blackwell, County Engineer, Leeds and Grenville

(Read by Mr. J. A. Sanderson.)

Mr. President and Gentlemen:

As the subject "Stone and Gravel Roads" has been more ably treated by many authors far more capable I will only attempt to touch on the outskirts of the subject, and point out a few of the lessons learned from our experience in building roads in the counties of Leeds and Grenville.

Stone roads have been systematically constructed as far back as A.D. 1764, when we read of M. Tresaguet building them in France, and since that time many different systems have been used, but the two principal are those known as the "Telford" and "Macadam," and these systems have been very much modified since the time of their respective progenitors.

The best system to use would depend very much on the nature of the foundation, and the general local conditions, including the money available for the work.

The most important factors entering into the construction of stone roads are: Drainage, quality of stone, rolling and gradients.

Drainage.—By "drainage" we mean not only the rounding of the road so that the water will rapidly run off the surface, but also the road to be thoroughly subdrained, either by means of side ditches or tile drains, and these should be to a depth below the action of frost, and where possible the grade of these ditches should not be less than 0.4 per cent. and tile drains 0.3 per cent.. and in all cases have a free outlet.

Quality of Stone.—The value of stone for road purposes depends on its wearing and bonding qualities, and these qualifications are not generally found together.

Lime stone on account of its bonding qualities forms an ideal road, but under heavy traffic soon wears into ruts. Granite, on the other hand, is very hard to bond, but of greater wearing value.

The writer has found that by using screened gravel as a bonding coat, the best results have been attained.

I have not taken into consideration "trap rock," as the cost of this stone makes it almost prohibitive for country roads in Ontario at the present time.

Rolling.—The strength and wearing quality of stone depends largely on the stone being thoroughly compacted, and the thorough rolling of the coarser grades is of more importance than the rolling of the bonding course.

On the roads of which the writer is in charge, the stone is put on in three grades; tailings, intermediate, and screenings, and the rule is for the roller to pass thirty times over each course.

That the stone should be well watered is necessary for good results, but care must be taken not to soak the foundation as this will cause mud to work up in the stone and prevent bonding.

Gradients.—When a road is to be improved a maximum grade for hills should be adopted. Mistakes are often made by improving one or more hills on a road and leaving other hills with steeper grade unimproved; it should always be remembered that the limit of haul on any road is governed by the grade of its steepest hill.

Where possible for rear townships roads the grade should not exceed 7.0 per cent. and for main roads 5.0 per cent.

Gravel Roads.

Gravel makes a very good substitute for stone for constructing roads where traffic is light, such as ordinary country roads. It is very easy to construct and repair, but, as in the case of stone, the foundation must be firm and thoroughly drained, and rounded to conform with the finished surface.

There are several ways of constructing gravel roads:

1. Those made of gravel, which has been crushed and screened similar to stone.

2. Those made of gravel as it comes from the pit.

3. The writer has adopted the following method:

All stone over 4 inches in diameter was rejected at the pit. When the gravel was deposited on the road it was thoroughly raked with a rake the prongs of which were 1½ inches apart so that all stones over that size were raked out to a depth of 6 inches. These were conveyed on ahead and covered by the next load; this formed a good foundation for the gravel, and very greatly strengthened it.

The gravel was put on 10 inches deep, and was consolidated by the traffic, a man being sent over the road from time to time to fill in the ruts and keep the road in shape while this was being done.

The cost of raking, placing the stone for a base, and keeping the ruts filled in was 10 cents per cubic yard.

The roads built in this manner are standing well under fairly heavy country traffic.

The great difficulty with gravel is that the proper proportions of sand to stone are not obtainable, except in few instances, without screening and mixing.

If too great a proportion of sand predominates, then the road is weak and easily rutted by the traffic, while if the stone predominates, to a large extent, it will not bond, thereby forming a rough stony road.

The proper proportion of sand to stone should be about 3 to 5 or 6.

A Delegate: With regard to Leeds County I regret there has been no information forthcoming as to how the county road system has worked out there. If that were forthcoming, I think it would be very important. We come here to try and

get information with regard to how the good roads system has worked out. I was in the County of Leeds last year, and I found there was a good deal of dissatisfaction concerning the county road system.

MR. SAUNDERSON: Unfortunately the speaker was in a very bad section. There was some trouble and there was a law suit which has been settled. At that time there was great dissatisfaction over a piece of road which has been graded, and owing to the elevation it was not possible to put stones on it, and the rain made that road almost impassable. There was considerable local friction introduced at the Municipal election, but I think the whole scheme has worked out very nicely.

A DELEGATE: What percentage of the farmers do you think are dissatisfied with the county road system?

MR. SAUNDERSON: I know that no man is bold enough to talk against it.

WAGON TIRES.

A. M. RANKIN, M.P.P., COLLIN'S BAY.

Mr. President and Gentlemen:

After having had considerable experience in road construction through the eastern part of the province, I feel that if ever the time can arrive when a bill should be introduced in the Legislature to prescribe the width of tires to be used on the highways, that time has now arrived. Last year I introduced such a bill, but, owing to illness, was not able to follow it up. This year I am presenting a bill somewhat more comprehensive than last year, and I would like to get the opinion of the convention with regard to the matter, as the farmers are the people who are going to be interested in this question.

It is in the form of a schedule. I do not believe a wagon should travel on the highway with less than three-inch tires. It is not necessary to go to any great length in describing this bill, because we all know that wagon tires have been road destroyers throughout the province. In Prince Edward County a bill was passed in their council some three years ago which provided that every wagon in the county should have three-inch tires.

All the evidence that I can gather from the United States goes to show that 90 per cent. are in favor of wide tires and 10 per cent. against it. Three or four years ago a farmer would not buy a wide tire, but to-day he will have nothing else. Where the wide tire has been used the tendency to cut the roads is not so great as when the narrow tires are used, and that is the reason I am submitting this bill to the Legislature.

It is not proposed that it shall come into operation this year, but on the 1st of January, 1916. It is not proposed, either, to bring in any drastic legislation. Ample time will be given for the manufacturers to dispose of their stock, and for the farmer to adjust himself to the new rules and regulations. I thought we should move along more progressive line, benefit by the experience of the United States, and adapt ourselves to more modern methods.

A DELEGATE: Explain what you mean by "a vehicle" in Clause 1. I don't understand the distinction?

MR. RANKIN: Anything that will carry two thousand pounds and over. Anything under two thousand pounds is not included in this section.

A DELEGATE: Does it cover towns and villages?

MR. RANKIN: Everything in the province.

A DELEGATE: Does it make any difference whether there is a spring on the wagon?

MR. RANKIN: Not a particle.

A DELEGATE: I think you are giving the farmer very little time in which to prepare.

MR. RANKIN: The farmer can see what is ahead of him, and he will make the necessary preparations.

A DELEGATE: Some of the best farmers have waggons twenty-five years old, and they are in good running condition.

MR. RANKIN: You have got to draw the line somewhere.

A DELEGATE: We are all interested in good roads, and this is a matter which must go along with a good road system. Unless there is some provision made regulating the width of the tires on heavy vehicles it is almost useless to undertake the construction of good roads. If you think for the moment that you can make good roads which will carry such wagons as have been referred to you are altogether mistaken. I have had some experience, and I am perfectly convinced that one of the main questions which affect the good roads system is the width of the tires, which must be commensurate with the load the wagon is carrying. Do not let us quibble about some little difference of opinion, as to when the Bill shall come into force and when it shall not come into force. We all know that the Legislature is not going to interfere particularly with the rights of our people. The manufacturers say they are perfectly satisfied to make the tires the right width. You must have a wider waggon tire or you cannot maintain your roads after you have built them.

A DELEGATE: Reference has been made to the farmer's waggon; what about the automobile? Is there anything in this Bill about the automobile?

A DELEGATE: I would like to point out that the Bill was submitted to the Resolutions Committee, and would it be wise to discuss it now?

MR. T. L. KENNEDY: The resolutions will be presented in ten minutes.

A DELEGATE: The Resolutions Committee were of the opinion that they were willing to approve of the principle of wide tires, but I don't know that they will approve of all the details contained in that Bill. I think the prudent course be for the convention to approve of the wide tire. I do not believe that you can apply it to every section of the Province. As I have said the wisest course for this Convention to pursue would be to approve of the principle and let the details be worked out.

A DELEGATE: I will move as an amendment that the Convention approve of the principle of wide tires on all vehicles.

A DELEGATE: I will suggest that it be not put as an amendment. Let it go as an expression of opinion.

MR. T. L. KENNEDY: It has been moved that this Convention approve of the principle of wide tires on all vehicles.

A DELEGATE: We have a blacksmith in our town who says it is the simplest thing in the world to obviate a large expenditure with respect to tires. He says he can knock a tire off and put a new one on for about $16. It is a simple matter to put on a wide tire.

The resolution was agreed to.

COUNTY ROADS.

R. H. Fair, Esq., County Road Superintendent for Frontenac.

Mr. President and Gentlemen:

My name is down on the programme in connection with a discussion on "Stone and Gravel Roads," and the question has been asked how are we to build these roads, and how are we to maintain them, and another question has been asked as to how the County Good Road System is working out in our County. As far as the County system is concerned it is working all right. The only trouble is that I do not think that we should build roads without debentures. It is impossible to make roads to fulfill expectation with the amount of money which is put in the hands of the superintendent or engineers. That is a matter that most of you have discussed. I am not in favor of debentures as a rule, but in this road-building business I am, and I will give you my reasons. We are farmers to-day, but we are not always going to farm. Is it right that we should put this tax on ourselves so that those who follow us shall enjoy the benefit of our hard labor? I think we are justified in raising debentures, and I will go as far as to say that it is the only way we shall accomplish anything in the good road direction. It is just as necessary for the Government to give an appropriation in regard to maintenance as it is to construction. In our County the roads are left in the hands of the reeve. He directs where the work is to be done. Then it is left to the superintendent to spend the amount of money which has been appropriated according to his best judgment. There is nothing for maintenance; that is left to the township. Those people who have a good piece of road in front of their doors, the council is not going to keep it in repair when there are other people who are up to their ankles in mud, and it is for the Government to step in and say it will assist along the line of maintenance. With regard to the superintendent; he is interested in the piece of road under his charge. If it is left to the township to maintain; it is left in the hands of disinterested parties. I say that the people who build the roads should maintain them. We have limestone in abundance in a great many places, but the first principle to be considered in connection with good roads is good drainage.

A Delegate: About what percentage do you hope to improve in your county with the present levy?

Mr. Fair: We have 137 miles mapped out.

A Delegate: The Government contributes one-third?

Mr. Fair: Yes, on construction, but we are distinctly told that if we do any repairs it must be done by the county.

A Delegate: About what percentage of your roads will be covered outside of the 130 miles?

Mr. Fair: I cannot answer that question.

A Delegate: How many people of the county have good roads?

Mr. Fair: We may be a little differently situated from others, but in our county we have taken up all the main arteries. The traffic comes from the whole length of the county, and the main arteries are the roads we are operating on at the present time. There are 137 miles of those roads in our county. I would be perfectly satisfied with our system if we had built all those county roads.

A Delegate: I understand you draw a distinction between maintenance and repairs?

MR. FAIR: If you go to a great expense in building up a first class road and let it remain until it goes to pieces you are losing money.

A DELEGATE: What would be your idea with regard to the two Governments building a certain amount of roads on their own responsibility and maintaining them?

MR. FAIR: In our county I would not approve of it. The trunk road would go through a very small part of the county. I suppose it would not cover one-tenth part of the county which should be served, and there will be very few farmers who would have any use on that road; probably only two townships. It would not serve the farmers, and I am going to stand for the farmers. If money is going to be expended I say spend it on the 137 miles in the County of Frontenac.

A DELEGATE: The Government gives money to each municipality according to the roads in each municipality. My point is that each municipality should spend money and the Government should give an equivalent.

MR. FAIR: One township will do it and perhaps the other will not. The county road system serves the purpose of this county. If you form a good county system and get fifty per cent. instead of one-third of the construction, and fifty per cent. of the maintenance, whether it comes from the Dominion or the Local Government, it will not come any too hard on the farmer. and we shall get satisfaction all the way round.

THIRD DAY

Friday, February 28th, 1913

Morning Session, 10 o'clock.

The Vice-President in the Chair.

TOWN AND CITY STREETS.

G. G. Powell, City Engineer, Toronto.

The question of good roads is now receiving the earnest consideration of all classes of the community, and while to many here to-day the particular application of the good roads movement to cities and towns is not of special interest, yet the viewpoint of those having to do with the pavement of the large municipalities may be of some interest.

During my experience in Toronto I have found that the people are, as a whole, greatly interested in the question of pavements, and will generally take the initiative in this matter, in fact, demands for pavements are often made by property owners before the sewers are constructed, and during a period of great real estate activity the requests for pavements of one kind or another are so great as to tax the best efforts of the Works Department to keep up with them.

The pavement work of Toronto is all carried out on the Local Improvement Plan:

1. On petition.
2. On the initiative or without petition.
3. On the initiative by 2-3 vote of Council.

1. When a work is undertaken on petition, the requirements are as follows: A petition form must be obtained from the Works Department giving the description of the street to be paved, width of pavement, cost per foot frontage, annual cost per foot frontage for the life of the pavement, and in order that the people to whom this petition is presented may have an opportunity of knowing the cost of any other pavement, a table of these costs is printed upon the petition form. This precaution is taken so that a person signing a petition can not plead ignorance or misrepresentation in regard to the price to be paid. Such a petition is considered sufficiently signed when it bears the signatures of sixty-six per cent. of the property owners, representing fifty per cent. of the property value.

When a petition is presented and declared to be sufficiently signed a recommendation is made to the council, and if passed by that body the work may be proceeded with.

2. If a work is deemed necessary by the Works Commissioner a recommendation is made on the initiative. When this recommendation passes council, notices are sent to the property owners, and a month is allowed for the owners to petition against the improvement. If no petition is received within this period, the work may be proceeded with. A petition against, to be sufficiently signed must have the signatures of a majority of the property owners, representing at least half the property value.

3. In cases where trouble is experienced in getting a local improvement laid and where such an improvement is deemed necessary by the Works Commissioner,

as being in the public interest, a recommendation is made, and if passed by a two-thirds vote of council the work may be proceeded with, notwithstanding any objections or petition against by the property owners.

With machinery as outlined above, a municipality is well equipped for carrying out any campaign for street improvements that may be decided upon.

The question of the selection of a pavement for a given street is often a difficult one where there are so many kinds to choose from, but, generally speaking, the elements that enter into this selection are,—

1st. Durability, having regard to the traffic to be expected after paving.
2nd. Grade.
3rd. Cleanliness.
4th. Cost.

Permanent pavements are now generally recognized as being best for the more or less heavy traffic to be encountered in a city, and practically no other pavements are being constructed in Toronto. Permanent pavements are generally defined as those having a concrete foundation, and the practice has been to vary the depth of concrete foundation according to the traffic. These depths vary as follows:—

4 in. for light traffic.
5 in. for medium traffic.
6 in. for heavy traffic.

The so-called permanent pavements are divided as follows:

1. Sheet pavements.
2. Sectional pavements.
3. Monolithic pavements.

Under sheet pavements are included: Asphalt, asphaltic concrete, tar concrete, bitulithic, and a number of other patented bituminous pavements.

Sectional pavements comprise: Brick, stone setts, wooden block, and asphalt block.

Monolithic pavements include the various forms of concrete pavements and probably asphalt macadam and tar macadam can be included in this list.

For our guidance in selecting a pavement for a given street, the following table has been made, viz.:—

Up to 3 per cent. grade, any pavement.

From 3 per cent. to 5 per cent., brick, stone sett, asphalt macadam, asphaltic concrete, concrete macadam, rocmac, bitulithic, asphalt block.

From 5 per cent. to 7 per cent., brick, stone sett, macadam, rocmac.

Above 7 per cent., macadam and rocmac.

For heavy traffic the pavement most in use in Toronto is asphalt, although brick and wooden block have been laid in a number of cases.

The merits of the brick pavement are, apparently, not very highly appreciated in this city, as almost invariably our recommendations for a pavement of this material are petitioned against, the only reason given being the noise. The repair bill on our brick pavements is much smaller for the same area than for any other pavement.

In the residential districts asphalt and bitulithic are about the only two pavements laid, although it is expected that asphaltic concrete, asphalt macadam, or rocmac will be laid in increasing quantities as time goes on.

A patented pavement is not recommended unless a sufficiently signed petition has been received asking for such a pavement. The sheet pavements have reached this popularity for residential streets, due largely to their comparative dustlessness and lack of noise.

The standard width of pavement adopted in Toronto for a main thoroughfare 86 feet wide, where tracks are laid, is 54 feet from kerb to kerb, allowing 18 feet of pavement on either side of the track allowance, or 19 feet 3 inches if we include the blocks next the rails. This width provides for the two lines of traffic. Where the street is only 66 feet wide and tracks exist the standard is 42 feet, giving a pavement 13 feet 3 inches on either side of the track allowance, including the blocks next to the rails. On residential streets, the standard width of pavement is 24 feet, although in the past some pavements as narrow as 18 feet have been constructed. Pavements of greater width than 24 feet are laid where traffic conditions warrant it. There is now an agitation to have the standard width for residential streets increased to 28 feet. The agitation for this increased width is due to the increase in motor vehicles and the desire of their drivers to be able to pass slow moving vehicles with less inconvenience.

I am of the opinion that such a provision is good in so far as the more important thoroughfares are concerned, but it is a hardship to force people to pay for a pavement of greater width than is needed for the traffic of the street, and it will also increase the cost of maintenance materially.

The crown of pavements in a city is also a very important question, and while a high crown tends to increase the life of a pavement, by causing the surface water to run quickly to the gutters, it is very hard on horses in frosty weather and in summer time when flushing is being resorted to. This difficulty has become so great during the past year or two that we are now reducing the crown of all new pavements very materially. A few years ago the standard crown for a 24 feet asphalt pavement was 6 inches. In 1911 this was reduced to 5 inches, and a further reduction to 4 inches is now contemplated.

Drainage troubles in the construction of city pavements are not very serious, for, as a general rule, the streets are provided with the necessary storm sewers for taking care of the surface water. Catch basins are constructed on opposite sides of the street about every 300 feet, with large openings so that the surface water may quickly reach the sewers. These openings are provided with suitable grates to prevent larger solids from entering the catch basin, and a trap is usually provided to prevent the escape of sewer gas, and also to keep floating rubbish from entering the sewer. In order that the catch basins may be kept clean they are provided with a semicircular bottom which enables the long scoop to be effectually handled. The main difficulty in connection with surface drainage that has to be contended with in Toronto is getting rid of the water on some of the east and west streets where the grade is practically level. This is usually accomplished by what is termed false grading, that is, the face of the kerb is increased at the catch basin, and decreased at a point some distance away. In this manner two to three inches of additional fall may be secured, which will effectually carry away the water.

One of the most important features of pavement work as carried on by a municipality is inspection, and, as a general thing, great attention is given to both inspection of materials and supervision of the work, to see that the provisions of the specifications are being carried out.

The city of Toronto is provided with a good testing laboratory, in charge of a capable chemist, in which all materials are carefully inspected. Every carload of cement used on city contracts must pass the ordinary seven day test before used on the work, and if any doubt is aroused as to its soundness it is held for twenty-eight days. All asphalt, asphaltic mixtures, fluxes, etc., are investigated in the same way, so that the city is reasonably sure of good work, notwithstanding the five year guarantee exacted.

The sand and stone that are used in the manufacture of a pavement must also have careful consideration, and to this end numerous sand and stone gradings have to be made each year to verify the standards laid down in the specification.

The organization in force to look after the actual construction work is as follows:—A district superintendent in charge of all contract work in a given district, and under his care sufficient inspectors and timekeepers to take care of every branch of the work.

Probably the feature that gives rise to the greatest amount of controversy between the Engineering Department and the property owners is the question of grade, and the greatest care has to be exercised at all times to see that the grade established on any street does not give rise to claims for damages. Apparently it does not matter whether you cut or fill, the claims for damages appear just the same. Little or no difficulty is experienced in the older parts of the city, but when we start to work on some of the newly annexed portions of the city we are met by conditions that are hard to overcome, buildings have been erected without regard to probable street levels, and as a result the grade has to be mutilated in order to provide proper access to the property.

To overcome this trouble in the future, the Department now gives building grades to intending builders, and any new streets accepted by the city are only accepted on conditions that no claims for damages will be made by reason of the grade established for the roadway.

Instances have occurred in certain parts of the city, where 12 per cent. grades have been established because the cutting or filling necessary would have practically destroyed the adjacent property.

The costs of the various pavements are as follows:

2 inch asphalt, 1 inch binder, 6 inch concrete	$2 25
2 inch asphalt, 1 inch binder, 5 inch concrete	2 00
2 inch asphalt, 1 inch binder, 4 inch concrete	1 60
2 inch asphalt, 1 inch binder (surface only)	1 05
3 inch asphalt block, 4 inch concrete	3 45
2 inch bitulithic, 4 inch concrete	2 15
2 inch bitulithic, 5 inch concrete	2 30
2 inch bitulithic (surface only)	1 75
Brick on 4 inch concrete (Canadian)	2 55
Brick on 4 inch concrete (American)	2 75
Brick on 6 inch concrete (Canadian)	3 00
Brick on 6 inch concrete (American)	3 20
Wooden block on 6 inch concrete	4 80

The concrete foundation work is composed of:—

1 cement, 3 sand, 7 stone.

By instruction from Council the Works Commissioner has to submit a tender for all work advertised, with the exception of large bridges and buildings for which special plant is required. As a result the Department does a good deal of work by day labor.

In order to carry out this work economically and efficiently, adequate plant and superintendency is necessary. Last year Council sanctioned the purchase of a great deal of plant for sewer and roadway construction, which will place the Department in good shape to undertake any work of this character that it may be called upon to do. In addition to good plant a force of efficient foreman and superintendents

is necessary, and I am glad to say that the city is as well provided with good men to fill these positions as any similar organizations anywhere. The day labor work is carried on as a separate branch of the roadway section, with its own superintendents and timekeepers.

In order to give you some idea of the magnitude of the business carried on by the Department, I will give you here a few statistics:

40,000 yards of pavement laid in 1912,
6 miles of tracks paved,
100,000 tons of stone.
30,000 tons of sand,
60,000 barrels of cement,
1,200 tons of asphalt,
and other materials in smaller quantities.

The maintenance of city pavements is probably the most important feature, and at the same time the most difficult to properly carry out, but after a good deal of experiment a scheme has been adopted which will probably give good results. The city is divided into compartively small sections, and in each one of these sections is located a district foreman who has a store yard and sufficient men at his disposal to properly patrol the streets and to make the necessary repairs without delay. The additional plant spoken of above will provide us with enough rollers and other plant to do this.

A special feature of this organization is that at definite intervals a report will be made showing the condition of all streets in the city, and will enable the Department to plan future work a long way ahead.

One of the most troublesome features of maintenance work is the repair of cuts made for the installation of water services, gas services, and private drains, and, apparently in Toronto, nothing has yet been devised to prevent this trouble, although frequent attempts have been made. In some cities legislation has been obtained compelling property owners to have all these services installed before the pavement is laid, but here we have no such law, but are permitted by the Local Improvement Act to recommend both water and sewer services as local improvements, charging back the cost to the property affected. This is not an ideal provision, because property changes hands so frequently and services installed to suit one individual would have to be changed to suit the next, who might desire to arrange his buildings on the lot in a different manner, and, as a consequence, the pavement would have to be cut.

By co-operation with the various public utility corporations it is expected to reduce this cutting to a minimum this year, and it is hoped that all cuts made will be promptly repaired, as they will be reported at certain fixed intervals by the patrolmen.

In 1908 the civic asphalt was put in operation, and since that time all repairs to pavements out of guarantee, and a good deal of new work has been carried out by the Department. Costs have been reduced and a more satisfactory condition of the streets have been maintained.

In 1907 the city paid 76 cents a yard of surface to the contractors for repairs, and in no year since that time has our cost exceeded this figure.

The city has also a small crushing plant—a No. 4 Austin gyratary crusher with a fairly large bin capacity. This crusher is used to crush old material that comes off the street, and which can be used again as broken stone for concrete in

track allowance foundations. This plant enables us to use up material that would otherwise be wasted or remain in the store yards for an indefinite period.

It is also a great convenience in times of shortage of broken stone, for the rubble can be secured and crushed and some of our jobs kept going.

I have tried to give you a brief outline of our work in Toronto, and feel sure that when men interested in the good roads movement meet together to discuss ways and means for bettering present conditions, much good will come of it. The movement is spreading, and I hope very shortly to hear that all you gentlemen have secured the necessary support, both moral and financial, to enable you to establish throughout Ontario a system of good roads that will be the standard for work of this kind throughout the whole country.

TOWN AND CITY STREETS.

T. H. Jones, Esq., City Engineer, Brantford.

Mr. Chairman and Gentlemen:

I have listened with a great deal of pleasure to the very comprehensive paper which Mr. Powell has read to you. A good many people seem to think that the smaller municipalities have rather a feeling of jealousy in reference to Toronto. Perhaps that is natural in some respects, but I think, over and above the feeling of jealousy, there is a feeling of pride in the great Queen City of this Province, and in the construction of pavements and public works the experience which the smaller towns and municipalities gain from Toronto is invaluable. To give an instance of that I need only refer to the Annual Report published by the City Engineering Department of Toronto. I have seen a good many reports, but I have seen nothing which equals that report in comprehensiveness in every detail. and in giving information which is of great value to other municipalities.

The subject of the paper, as appears on the programme, being "Town and City Streets," I was not quite sure what line Mr. Powell would take, but he has covered the question of pavements in a most comprehensive manner, and in order to open a discussion I purpose just dealing with perhaps two or three points in reference to streets. One of these is the question of sidewalks, in reference to their location. Some towns have adopted the policy of constructing the walks on the inside of the boulevard, while others have constructed the walks on the outside, so that the curve of the walk forms the curve for the street pavement.

Which ever plan is adopted there should be a definite policy. in the early days, with reference to it. If there is one thing which is worse than another is to have some walks on the outside of the boulevard, while other streets have their walks on the inside. In Brantford a system of walks inside the boulevard was adopted, but in some cases a few walks have been laid the other way, although the former was more popular. It's a question whether an engineer should carry out work which he does not consider feasible and right; but it is pretty hard sometimes not to do as one is told. A walk which is constructed on the inside is further from the street, and pedestrians are less likely to meet with accidents. Then when a walk is constructed on the outside of a boulevard there is no way in which to make a private driveway without cutting into the walk, or having your driveway protrude into the streets, and I find that nearly all municipalities and engineers are in favor of the walk being constructed on the inside of the boulevard.

It is essential to have a curb placed on the street. I think that a street without a curb even though that street might have a nice Macadam road, has the same effect as a pavement which has rough sides. Mr. Powell has touched upon the necessity of having the sewer, water or gas connections made before the pavement is put down. That is a very important point. A plan should be prepared showing where the different connections are, and that this work has been done before the pavement is put down. In reference to the pavement question itself we have had a great deal of valuable information in the paper which has been just read. In our own little town we have been rather backward in the way of pavements until the last few years, but I think that the opinion is pretty general that the day of the water bound Macadam for a business street is past; I mean a street which is subjected to very heavy traffic.

I have learnt a good deal since I have been attending this convention, and that is that nearly every speaker should tell a story, and one has occurred to me. An Irishman was working on the scaffolding of a building several stories high. The building was a hotel, and the scaffolding gave way and the Irishman fell. The guests were watching from the windows, and as he passed the upper storey he shouted "I'm alright so far." As he proceeded downwards and passed the next window he cried "Oh my poor wife." At the next window he shouted "Oh my poor children," passing the next storey it was "Oh my poor father and mother," but when he reached the first storey from the ground he was heard to say "Now for the bloody bump." Before the era of automobiles the roads were sufficient for heavy traffic, but they now result in very "bloody bumps" for the travellers.

In connection with the construction of the walks at Brantford we constructed a great many concrete crosses, and in many places they have worn very well indeed. At first the construction of the pavements was done by the contractor putting in a concrete foundation, and the city found that by tendering for this work a saving of $15,000 was effected. We have made experiments in the way of construct-foundations, the first being put down in 1911 on a residential street, and a little later on we went to work on another residential street and last year we did the balance. A great deal of many interesting points were brought out in the paper contributed by Mr. Powell, and I think I have spoken long enough in the way of introducing this subject. (Applause.)

ADDRESS.

Hon. Martin Burrill.

Mr. Chairman and Gentlemen of the Good Roads Association, I need hardly express the pleasure with which I accepted the invitation to come here to-day to show my practical interest and sympathy in the work with which you are identified in connection with the good roads system. It is not very easy for a Minister of the Crown to get away from the House of Parliament at the present time, and lest any of you may think I have run away from a very palpable duty I would like you to understand that I did not run away from a certain celebrated Bill last night in the House of Commons without being very careful to pair with a gentleman on the opposition side. I do not like to refuse to come down to meetings such as these without some very good reason, one of which is that although there is work to do in Ottawa I have always felt, in common with other Ministers of the Crown, that it is absolutely necessary for the members of any Government to come as much as possible in direct contact with the people who are carrying the necessary work of this country, and by personal contact get fresh inspiration for the administrative duties which fall to the lot of a Minister of the Crown. (Applause.)

I think we all recognise that a lot of the foundation work which is being done in this country is being done by efficient associations of this kind, consisting of men who are banded together with one common interest, devoted to certain aims, and who, by their knowledge of the subject, by their enthusiasm, by their knowledge, by their individual efforts and their co-operative efforts, can bring such a pressure on public sentiment as to crystalize the general feeling, and make it possible for Governmental bodies to bring that knowledge into practical effect by means of legislation. Without the work of an association of this character it would be impossible to get a great deal of useful legislation passed, and if there were not a strong public sentiment which you have crystalized and made possible.

It is true that I am here masquerading in false colors when the Minister of Railways might have been present: but I think the Departments of myself and my good friends are fairly closely related, and I know that we both have at heart anything which will make for the betterment of the highways and the betterment of that great industry with which I am immediately associated: the Department of Agriculture, work which is so closely associated that it is impossible to help one without the other. Let me refer to agriculture in this way. It is true that the particular duties and responsibilities which fall to me as the Minister of Agriculture are concerned with the betterment of conditions—the agricultural conditions of Canada, which to my mind not only reflect but actually represents the final prosperity of a country like ours. If the agricultural conditions are not in a satisfactory condition, if there is no satisfactory progress being made throughout our rural communities, then you cannot look for any permanent prosperity in our great urban centre. In the truest sense of the word, especially in Canada, agriculture may be said to be the basic necessity of the whole country.

There is a spirit abroad in Canada of practical interest in the work of agriculture which has never before been displayed amongst public bodies, in the whole history of this country. It has been a matter of gratification to me, connected as I am with agricultural proposals, to receive a great many letters from prominent agriculturists and those whose interests are bound up in city life and industrial enterprise. Those letters have contained a frank and generous recognition of the

fact that anything that is done to stimulate along right lines the agricultural industry will be whole-heartedly supported by the great cities of Canada, who recognize that urban progress must go hand in hand with progress in rural communities.

It is true that in the past forty or fifty years a tremendous development has taken place in the scientific side of agricultural research work; the development has been so tremendous as to practically revolutionize the whole business of agriculture. It is equally true that that has not filtered down to the average man who is carrying on the business of farming in the country. It is true that the main part of that research work and scientific knowledge which has been dissiminated has not been largely concerned with such matters as the sale of the crops, live stock, and that which concerns the betterment of the conditions of production; but farming, no matter how successful you can produce, no matter how many steps forward you take, fails, and must fail unless you devote some attention to the marketing of the produce. Directly we strike that phase of it we strike a phase which you gentlemen are all bound up in as far as this association is concerned.

There is a great deal of discussion as to whether the world is getting any better or not. I am optomistic. I think the world is getting steadily better all the time. While we see a great many things which bear an unfavorable contrast with those of the old days, yet I do not think that a man who intelligently looks into the condition of our modern life to-day and compares it with the life years ago can fail to recognize that conditions have immeasurably improved since the days of our forefathers.

If there has been anything which has transformed our modern life, which has revolutionized our modern life, as compared with the life of one hundred years ago, it is this great question of transportation. In the first place transportation has annihilated distances. For instance, I can come from my Province of British Columbia, a distance of three thousand miles, in four and a half days. I remember, about three or four years ago, stopping at the "Black Swan" in York, in the old country. It was the inn from which the first coach started to make the long journey to London in days gone by, and they told me that it took just about the same time for that old stage coach to travel to London, a distance of 300 miles, as it takes me to go home to my Province of British Columbia. That is an illustration of what has come over our whole condition of modern life, affecting us in every economic way. It has also done a great many other curious things. It has put an absolutely new phase on the products of man and the remuneration he receives, and on the keen competition every one of us meet where we have a ready and easy market at our doors.

I was reading with great interest, recently, an interview which took place the other day with that famous Englishman, Sir Horace Plunkett, and he mentioned that one of the reasons for the deplorable condition of agriculture was the faulty means of distribution, both in the way of selling and in the way of getting things to the market. If a farmer has first-class communications in the matter of highways to the railway centres, he will be in a position to eliminate a loss and reap a profit where he made a loss before. I think we should all agree that this question of good roads has an important and vital connection with the whole subject of agriculture, agricultural production and prices.

We have an enormous belief in our future, and every chap who starts a town site is perfectly convinced that it is going to result in a townsite larger than Toronto. (Laughter.) I remember in one mining section, that they came to

the conclusion they were also of some agricultural importance, and they got an Agricultural Hall erected which cost several thousand dollars. They determined to hold an Agricultural Exhibition. One gentleman told me that, unfortunately, a day or two before the opening, the one solitary entry in the Live Stock class, which was a calf, had died, having broken out and eaten the only pumpkin that was exhibited, and the fair had to be postponed for a week. We do make some mistakes in that way. (Laughter.)

I was much interested in the addresses regarding Statute Labor, and I was amazed to find you had that system in Ontario. I had thought you had altogether abolished what may be fairly considered to be an inadequate and inefficient system. When people condemn Statute Labor too strongly, I think we ought to remember what Statute Labor did for this country, what could not possibly have been done otherwise. The system by which Statute Labor combines in certain districts for the betterment of their roads, doing that which could not have been done in any other way, is an evidence of the zeal which our forefathers possessed in trying to improve the condition of the highways, realizing clearly that they were doing the foundation work of their country. As the country has grown and developed the weakness of the scheme was made clearly apparent, that it was hopeless to continue it, and it ought to be discarded for a more efficient system.

I remember quite well how the Good Roads Movement was first started in a little hall in the County of Lincoln. People felt that the time had arrived when something should be done to improve the condition of the roads, and they called a public meeting. I had only been out from the Old Country a year or two, and the Old Country is a place where they have pretty good roads. I was called upon to give my experience and I ventured some rather strong criticism of the roads in Canada. I ventured, in my callow youth, to make some comparison between the roads in Lincoln County and England. There was a gentleman in the audience who said that if I thought that the roads in England were better over there than they were here, it was a pity I did not go back. (Laughter.) I think it is true, when we first come out to this country, we are a little fresh in our criticisms, but I think the answer I gave that man was a fairly good one. It was to this effect. I said that I thought if my friend who made that remark saw a thing which was good he should be prepared to back it up; and if he found a thing which was bad it was his business to try and make it better. The character of the roads in some parts of the country is hopelessly bad. When they are done in an inefficient way they remind me of a story concerning Abraham Lincoln. Abraham Lincoln was a tall, ungainly chap, and when he went to his first political meeting he had his trousers rolled up about ten inches high, with a piece of shank showing. He was an extraordinary looking character. Some fellow came up to him and said, "You are Mr. Lincoln?" "Yes," he said. "They tell me you are a self made man," said the man. "Yes, I think I may say that" said Lincoln. The man looked him up and down from top to bottom and said "It's a d—— bad job." I think we may fairly say the same thing concerning some of our roads, and the time has arrived when there should be an efficient, capable, collective management of roads on scientific lines, because good roads are of vital importance to the public welfare.

It is true that in the past this matter has been left very largely to the control of the Provincial Governments. Matters of internal administration, education and roads, have been left to the jurisdiction of the Provincial Government, with the exception that anything which affects communication between one province and another comes more particularly under the Federal Jurisdiction. Both in

regard to agriculture and roads, as you know, the Government has made a rather new departure, a departure which has only come into operation. Before this Government went to the country Mr. Borden, as is the custom of all political leaders, gave to the country the programme his party expected to carry out. A promise has been made, and the people may be assured that the Government, will honestly endeavour to give liberal assistance for the purpose of supplementing and extending the work of education, agriculture and the improvement of the highways.

We recognize that in the past the Federal Government has not dealt with the provinces as generously as it should, but we have had to spend tremendous sums in other directions on public works of every kind, and other matters I need not touch on. But when the revenue has tremendously increased, and to which all the people have contributed, it is not unfair or unwise, but very much the reverse, for the Government to assist the province by giving it some further financial help for both the betterment of agricultural conditions and good roads. That we have recognized, and a Bill was brought in last year for that purpose in which the sum of one million dollars was to be divided according to the population, and spent on a system of good roads. There has been some misinception with regard to it, and the Bill was wisely or unwisely rejected, and consequently no province in the country got any money. Ontario would have got about $350,000.

One of the grounds upon which the Bill was objected to was that there was a clause in the Bill, as there is a clause in the Bill this year, to the effect that notwithstanding anything in the Acts to the contrary, power was given to the Federal Government itself to spend that money. If the clause had ended there the Senate would have been justified in rejecting that Bill because it would have been an invasion of Provincial Rights. But that clause did not stop there. It simply said that it gave the Federal Government a right to spend that money on the roads in the province with the consent of the Provincial Legislature and the consent of the Lieutenant-Governor in Council of Canada. If any province did not think it could devise a proper system of roads on a big scale and preferred the Federal authority to do it, permission was given to adopt any scheme the Federal Government might propose. I would ask if that was not an absolute safe-guard, I think you will agree with me that it was. The Bill has been re-introduced this Session, and I can say that certainly not a less sum than we proposed last year, which was one million dollars, will be again devoted to the purpose of assisting the province in the matter of Good Roads. I may also whisper that it is likely to be more rather than less. (Applause). As to what may be done, or what may be the fate of the Bill, I do not care to discuss now. I will say that as far as this Federal Government is concerned, both in that Bill with regard to good roads, and the Bill with respect to agriculture, there is a sincere desire on the part of Mr. Cochrane, myself, and the Government to keep politics altogether out, and to do something substantial to help forward a movement upon which the welfare and prosperity of this country so tremendously depends. (Applause.)

I have no little faith in the Canadian people, no matter what line of politics they follow, but I do say that any man, Liberal or Conservative, who is interested in this question of agriculture and the improvement of the highways of this great country should be prepared to place his principles before party shibbiloth. I come from a province which is specially interested in good roads, and which has perhaps more difficult and comprehensive problems to face than any other province in Canada. It costs us in connection with roads and bridges probably nine dollars

to every two spent by any other province. The question of good roads, in particular, is a very important one. This matter of good roads does not affect only the Government or only the people, but it is one that affects the whole country, and everybody is interested in it, so it is not a matter of local but of general concern and, therefore, the Government can afford to move in a large and generous way. The energetic members of this association have long recognized that this question is one of national concern, and that it is necessary for us to spend money on perfect equipment in the interests of the producers of this country.

I have expressed to you, on behalf of the Government and myself, and on behalf of my friend, the Hon. Frank Cochrane, the importance and necessity of the work which you, as members of the Good Roads Association, are carrying on. We wish you not only good luck but the fullest measure of success in the foundation work you are doing, and from which other and larger bodies can draw inspiration to put those things into practical, legislative affect, and enable them to carry out what you, yourselves, individually and collectively, have been honorably striving to attain for so many years. I wish you every success. (Applause.)

THE CHAIRMAN: I am sure we are all greatly pleased at the visit of the Hon. Mr. Burrill, we thank him for his splendid speech, and we cordially invite him to come again.

FINANCIAL STATEMENT, 1912-1913.

February, 1913.

Receipts.

Balance on hand	$28 49
Government grant	300 00
County of Halton	10 00
County of Lambton	10 00
County of Prince Edward	15 00
County of Elgin	10 00
County of Brant	15 00
County of Simcoe	15 00
County of Ontario	15 00
County of Waterloo	15 00
County of Perth	15 00
County of Lennox and Addington	15 00
County of Kent	15 00
County of Hastings	15 00
County of Leeds and Grenville	15 00
County of Northumberland and Durham	15 00
County of Lanark	15 00
County of Peel	15 00
Village of Stirling	5 00
Township of Thurlow	5 00
Township of Limerick	5 00
Township of Rawdon	5 00
Township of Sidney	5 00
Township front of Yonge	5 00
County of Halton	15 00
County of Stormont, Dundas and Glengarry	15 00
County of Elgin	15 00
County of Haldimand	15 00
County of Carleton	15 00
County of York	15 00
Township of West Garafraxa	15 00
Village of Winchester	5 00
Township of York	5 00
Township of Ignace	5 00
T. E. Laycock	1 00
County of Norfolk	15 00
W. H. Hubbell	1 00
County of Middlesex	15 00
County of Wentworth	15 00
R. H. Fair	1 00
J. W. Litton	1 00
	$742 49

Expenditures.

Expenses of President and Executive Committee	157 90
Reporting Convention 1912	65 00
Vising Railway Certificates	10 00
Postage and exchange	4 00
Printing	31 83
Balance in bank	414 76
Balance, cash on hand	59 00
	$742 49

Audited and found correct.

(Sgd.) Herbert Bowman, } *Auditors.*
(Sgd.) James Sheppard, }

Toronto, February 28th, 1913.

RESOLUTIONS.

1. That the Convention approve of the principle of wide tires on all vehicles.

2. That in the opinion of this Association the Provincial Legislature should consider the abolition of Statute Labor or legislation that will bring it about in all townships.

3. That where a road, that is part of a County Good Road System, passes through a village or town not separated from the county, we are of opinion that Government aid should apply to such part of the road to the extent of the width and cost of approved road in purely rural section.

4. That without in any way criticising the action of the Provincial Government because of the postponement of the announcement of the large policy upon good roads promised by them, this Good Roads Association begs most respectfully to represent to the Dominion and Provincial Governments that owing chiefly to the weather conditions of the last two years our county roads imperatively demand a much larger expenditure than has hitherto been made, and that as a consequence this Association asks that the Provincial and Dominion Governments each contribute at least one-third of the cost, both of construction and maintenance of all county roads and bridges, leaving the balance of the expense upon the county in which the work is done.

CONSTITUTION.

Article I.

Name.

This Association shall be known as the Ontario Good Roads Association.

Article II.

Location.

The headquarters of the Association shall be at the office of the Secretary-Treasurer.

Article III.

Objects.

The objects for which this Association is organized are to acquire and disseminate information concerning highway construction and maintenance in the counties, towns, cities, and other municipalities of the Province; to stimulate interest in the subject and to promote educational, legislative, and other measures tending to their accomplishment.

Article IV.

Membership.

Section 1.—The Association shall have the following classes of members, viz.: Municipal, active, contributing, life, associate, and honorary members.

Section 2.—The Municipal Members shall be the representatives of the Councils of Counties, Cities, Towns, or other Municipalities.

The annual fee to be paid by Municipal Corporation shall be for:

Cities over 100,000	$50 00
Cities over 50,000	25 00
All other cities	15 00
Counties	15 00
Towns	10 00
Townships and villages	5 00
Associate membership	25

Section 3.—Active members shall be persons who are actively engaged in laying out or supervising work of construction and maintenance of highways and streets and those interested in highway development, who contribute an annual membership fee of One Dollar to the funds of the Association.

Section 4.—Contributing members shall consist of societies or other commercial organizations paying ten dollars per annum to the funds of the Association, each contributing member shall be entitled to appoint one member to represent them at meetings of the Association.

Section 5.—Life members shall consist of active or associate members making a payment of Twenty-five Dollars upon their election to membership.

Section 6.—Honorary members shall be those who have performed distinguished service in the cause of highway extension and improvement. They shall be nominated by the Executive and elected by the Association.

Section 7.—Only Municipal and Active members shall hold office.

Article V.

Officers.

Section 1.—The Officers of this Association shall be elected for one year and shall be selected from its municipal and active membership and shall consist of two honorary presidents, a president, two vice-presidents, six directors, and a secretary-treasurer, who together shall constitute an executive committee of which five shall constitute a quorum.

Article VI.

By-laws.

By-laws for governing the Association shall be made by the Executive, subject to the approval of the membership of this Association at its annual meeting.

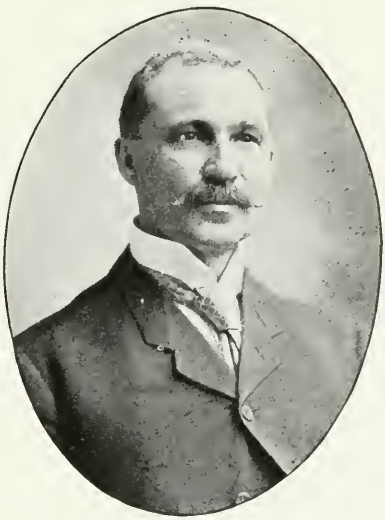
Article VII.

Amendments.

Section 1.—No amendment shall be made to this constitution until same has been reported upon by the Executive.

Article VIII.

It shall be the duty of the President to appoint a nominating committee at the first session of the convention. Such committee shall be composed of not less than five members. Such committee may be added to at the option of the Convention, and any increase in number beyond those appointed by the President shall be elected by the Convention. The total number shall not exceed ten members. The committee shall report nomination to the annual meeting.



HON. J. O. REAUME

MINISTER PUBLIC WORKS, ONTARIO

ROBERT EDGAR

SECRETARY LABOUR BUREAU

THIRTEENTH REPORT

OF

The Bureau of Labour

OF THE

PROVINCE OF ONTARIO

For the Year Ending December 31st

1912

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO:
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1913

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TORONTO

To His Honour Sir John Morison Gibson, K.C.M.G., K.C., LL.D., etc., etc.,

Lieutenant-Governor of Ontario.

May it Please Your Honour:

The undersigned has the honour to present herewith for your consideration the Report of the Bureau of Labour of the Province of Ontario for the year 1912.

I have the honour to be,

Your Honour's most obedient servant,

J. O. REAUME,

Minister of Public Works.

To the Honourable J. O. Reaume,

Minister Public Works, Ontario:

Sir,—I have the honour of submitting to you herewith the Thirteenth Report of the Bureau of Labour.

I have the honour to be, Sir,

Your obedient servant,

ROBT. EDGAR,

Secretary.

CONTENTS

	PAGE
Letters of Transmittal	3, 4
Introduction	7
Municipal Statistics—List of Municipalities Reporting	10
Reports from Municipal Clerks	13
Tables of Municipal Statistics	70
Summary of Municipal Statistics	85
Municipal Public Utilities Classified	86
Free Employment Bureaus—Applications, etc., for 1911	90
List by Trades for 1911	92
Labour Organizations—Returns in Details by Secretaries	94
Suggestions by Labour Organizations	181
Directory of Labour Organizations in Ontario	186
Table Showing Wages, Hours of Labour, etc.	215
Directory of Central Labour Organizations in Ontario	232
Industrial Statistics	233
Tables from Returns by Manufacturers	234
Tables Showing Wages and their Proportion to Product	270
Table Showing Increase or Decrease of Product and Wages in Factories	289
Changes of Wages and Hours	290
Co-operative Societies	293
American Federation of Labour—Table of Charters, Membership, Strikes, etc.	295
Table of Benefits Paid to Members by International Organizations	300
Table of Average Membership Paid Upon from 1897 to 1911	301
Laws Relating to Labour—Chronology of Ontario Labour Laws	302
Statute Establishing Ontario Bureau of Labour	303
Ontario and other Labour Legislation	304
List of Labour Departments and Bureaus and when Organized	313
List of National and International Labour Organizations with Affiliations in Ontario	317
Recent Legal Decisions Affecting Labour in Ontario	323
Trade Disputes in Ontario	339
British Labour News	347
Appendix	352

THIRTEENTH REPORT

OF THE

BUREAU OF LABOUR

1912.

INTRODUCTION.

The Thirteenth Annual Report of the Bureau of Labour of the Province of Ontario shows once more the continuous growth and progress of the work of the Bureau.

There has been an increase in the operations of the five free employment bureaus previously established at Berlin, Brantford, Hamilton, London and Ottawa, and the new branch located during the year at Walkerville has done its full share. Situations have been provided for 1,293 applicants.

The number of returns by municipal clerks have increased, there having been 807, as compared with 786 for 1910, and 769, 756, 704, 559 and 227 for the five preceding years. Much work that should be unnecessary was still needed to obtain this result, many clerks requiring repeated notices before reporting at all or rendering their returns more complete. The difficulties they profess in this respect continue to show defective book-keeping and incomplete records, even in some of the urban municipalities. The statistical tables, even though thus incomplete, show satisfactory municipal progress. There were reported 25,330 new buildings erected in 1911, costing $60,390,017; expenditure on permanent improvements, such as roadways, bridges, etc., $7,614,496; and on sanitation, including sewers, $3,714,988. The 19 cities report 16,131 new buildings, costing $43,169,362: expenditure on permanent improvements, $4,741,516: and on sanitation, $3,048,834. The 127 towns reporting (one defaulting persistently) give 3019 new buildings, costing $10,597,482; expenditure on public improvements, $933,504; and on sanitation, $543,547. The 141 incorporated villages, all reporting, give 740 new buildings, costing $1,256,800; expenditure on permanent improvements, $101,645., and on sanitation, $12,806. The 520 townships or groups of townships reporting, about 20 not doing so, give 5,440 new buildings, costing $5,365,873; expenditure on permanent improvements, $1,837,831: and on sanitation, $109,801. The reports of the clerks, given in detail, supply valuable information as to manufacturing establishments started during the year and openings for other industries.

The statistics given in the last three Annual Reports of public utilities owned and operated by the municipalities are continued, showing that their capitalization has increased to considerably over $43,000,000 for the 194 municipalities making returns. The 19 cities report assets of this nature amounting to $31,920,172. The towns $9,921,253, villages $1,346,856, and townships $213,783. In another table these public utilities are classified as follows: waterworks, $28,507,978; electric lighting, $10,210,824; gas, $649,780; street railways, $1,552,272; power, $1,116,844; telephone, $510,791; miscellaneous, $25,000.

The schedules returned by local unions have continued to increase in number, being 477, as compared with 384 last year, and 335, 358, 320, 271 and 156 for the five preceding years. Though the increase is to some extent satisfactory, it is evident that these returns are incomplete, some unions still neglecting to give the required information. In all other countries where labour is organized this strange indifference does not prevail, the returns being far more complete with an evident desire to make the best showing possible for the movement. A few secretaries still continue their practice of stating the hourly wages accurately, but of understating the weekly wages as shown by the hours and rates they mention, apparently dividing the year's wages by the 52 weeks, though the shortage is accounted for by the column giving the average number of days idle. This causes an unnecessary difficulty when claiming the usual rates and hours on public contracts, and as I have before mentioned if the expected Bill regarding Compensation for Industrial Injuries bases payments as in the British Act on the weekly wages this under statement would have to be overcome. The suggestions by unions following their report will be found useful by those who are studying the relations of capital and labour.

The increase in the number of returns from manufacturers still continues, there being 867 as compared with 759 last year, and 679, 652, 592, 427 and 205 for the previous years. Of these only 49 were too incomplete for tabulation, leaving to be so treated 818 establishments employing 57,991 persons, as compared with 707 employing 51,095 persons, 642 establishments employing 49,090, 610 employing 39,156, 536 employing 42,646, 384 employing 35,316, and 153 employing 8,505 in the six previous years. The aggregate number of days in operation in these 818 establishments was 229,473 as compared with 202,306; 183,186; 172,573; 154,905; 113,434; and 43,718 in the preceding years. The product was $139,990,138 as compared with $122,726,571; $111,392,169; $95,479,586; $100,097,507; and $18,473,139 previously. The wages were $28,022,416 as compared with $23,361,134; $21,392,444; $16,681,496; $19,123,227; $15,869,337; and $3,458,419 in the previous years. The average wage rate per year was $495.10, and per day $1.74 as compared with $467.80 and $1.64; $452.15 and $1.58; $433.99 and $1.58; $459.00 and $1.60; $449.43 and $1.52; and $406.69 and $1.48 previously. As there is no nominal list of the industrial establishments of the Province published by any trustworthy authority they have to be obtained

from various sources and consequently these statistics are not complete. Some manufacturers neglect to reply, and a few refuse to give any information. The 32 categories into which they are divided in the tables contain, however, a sufficient number to give a fairly representative idea of the general industrial position.

In the succeeding table, giving in condensed form the increases and decreases in product and in wages, it is shown that the average increase in product in all the classes was 13.83 per cent.; 50 establishments reported unspecified increases, 15 unspecified decreases, and 183 no change from previously. The average increase in wages in all the classes was 9.58 per cent.; 72 establishments reported unspecified increases, 44 unspecified decreases, and 249 no change from formerly. None of the classes reported average decreases in product or in wages. The increases were shared by 36,297 persons.

The notes of increases of wages and decreases of hours of labour though not exhaustive indicate a continued and more wide-spread upward tendency.

A new feature is the statistics of Co-operative Associations.

Labour legislation, trade disputes, legal decisions, directories of Labour Organizations, officials of Bureaus of Labour, etc., have received the usual attention and appear in the Report. The correspondence of the Bureau augments continuously. Over 5,000 copies of the Twelfth Annual Report were sent out, many in pursuance of special application. Having received many applications for the interim report of Sir William Meredith on Compensation for Industrial Injuries, I obtained a supply of copies and distributed over 300 to personal applicants and others interested in the subject. Schedules and circulars were mailed as usual to secretaries of unions, clerks of municipalities, and manufacturers. Over 1,000 letters were sent out, giving information required, asking for schedules or more complete details, and for similar objects in the scope of the Bureau. Personal interviews were also had in relation to fair wages and hours on public contracts, labour legislation, decisions by the courts, industrial statistics, etc., including requests for information by University and other students of political economy. I was gladly able to supply some data for the enquiry leading to legislation in regard to compensation for industrial injuries.

ROBT. EDGAR,

Secretary,

Bureau of Labour.

MUNICIPAL STATISTICS.

The following is a list of the cities, towns, incorporated villages and townships which responded to the schedules sent out to all the municipal clerks. Succeeding this are the reports in detail from the clerks giving accounts of the industries started in 1911, and the openings for others, besides the statistical information which is tabulated as usual. All the cities, nearly all the towns and villages, and all but about twenty of the townships made returns, the increase that has obtained for some years past being continued, but this was only secured by repeated applications in many cases, both for the reports themselves and for additional information where they were incomplete.

Note.—C. for City; Tn. for Town; V. for Village; Tp. for Township.

Aberdeen, Tp.
Abinger, Tp.
Acton, V.
Adelaide, Tp.
Adjala, Tp.
Admaston, Tp.
Adolphustown, Tp.
Ailsa Craig, V.
Albemarle, Tp.
Alberton, Tp.
Albion, Tp.
Aldborough, Tp.
Alexandria, Tn.
Alfred, Tp.
Algona, N., Tp.
Algona, S., Tp.
Allice & Fraser, Tps.
Alliston, Tn.
Almonte, Tn.
Alnwick, Tp.
Alvinston, V.
Amabel, Tp.
Amaranth, Tp.
Ameliasburgh, Tp.
Amherst Isld., Tp.
Amherstburg, Tn.
Ancaster, Tp.
Anderdon, Tp.
Anglesea, Tp.
Anson and Hindon, Tps.
Anstruther, Tp.
Appleby, Tp.
Arkona, V.
Armour, Tp.
Arnprior, Tn.
Arran, Tp.
Artemesia, Tp.
Arthur, Tp.
Arthur, V.
Ashby, Tp.
Ashfield, Tp.
Asphodel, Tp.
Assiginack, Tp.
Athens, V.
Athol, Tp.
Atwood, Tp.
Augusta, Tp.
Aurora, Tn.
Aylmer, Tn.
Ayr, V.
Bagot & Blythfield, Tps.
Balfour, Tp.
Bancroft, V.
Bangor, Wicklow, & McClure, Tps.
Barrie, Tn.
Barrie, Tp.
Barton, Tp.
Bastard & Burgess, S., Tps.
Bath, V.
Bathurst, Tp.
Bayfield, V.
Bayham, Tp.
Beamsville, V.
Beaverton, V.
Beckwith, Tp.
Bedford, Tp.
Beeton, V.
Belle River, V.
Belleville, C.
Belmont & Methuen, Tps.
Bentwick, Tp.
Berlin, C.
Bertie, Tp.
Beverly, Tp.
Bexley, Tp.
Biddulph, Tp.
Billings, Tp.
Binbrook, Tp.
Blandford, Tp.
Blanshard, Tp.
Blenheim, Tn.
Blenheim, Tp.
Blezard, Tp.
Blind River, Tn.
Bloomfield, V.
Blue, Tp.
Blyth, V.
Blythfield, Tp.
Bobcaygeon, V.
Bolton, V.
Bonfield, Tn.
Bonfield, Tp.
Bosanquet, Tp.
Bothwell, Tn.
Bowmanville, Tn.
Bracebridge, Tn.
Bradford, V.
Brampton, Tn.
Brant, Tp.
Brantford, C.
Brantford, Tp.
Bridgeburg, V.
Brighton, Tp.
Brighton, V.
Brock, Tp.
Brockville, Tn.
Bromley, Tp.
Brooke, Tp.
Brougham, Tp.
Bruce, Tp.
Bruce Mines, Tn.
Brudenell and Lyndock, Tp.
Brunel Tp.
Brussels, V.
Bruton, Tp.
Buchanan, Tp.
Burford, Tp.
Burgess, N., Tp.
Burgess, S., Tp.
Burns, Tp.
Burlington, V.
Burk's Falls, V.
Burleigh & Anstruther, Tp.
Burpee, Tp.

Cache Bay, Tn.
Caistor, Tp.
Caldwell, Tp.
Caledon, Tp.
Caledonia, V.
Caledonia, Tp.
Cambridge, Tp.
Camden, Tp.
Camden, E., Tp.
Cameron, Tp.
Cambridge, Tp.
Campbellford, Tn.
Cannington, V.
Canborough, Tp.
Canonto, N.& S., Tps.
Caradoc, Tp.
Cardiff, Tp.
Cardinal, V.
Carden, Tp.
Cardwell, Tp.
Carleton Place, Tn.
Carling, Tp.
Carlow, Tp.
Carrick, Tp.
Cartwright, Tp.
Casey, Tp.
Casselman, V.
Cassimer, Jennings, and Appleby, Tps.
Cavan, Tp.
Cavendish, Tp.
Cayuga, V.
Cayuga, N., Tp.
Cayuga, S., Tp.
Chaffey, Tn.
Chamberlain, Tp.
Chandos, Tp.
Chapleau, Tp.
Chapman, Tp.
Chapple, Tp.
Charlottenburg, Tp.
Charlotteville, Tp.
Chatham, C.
Chatham, Tp.
Chelmsford, Tn.
Chesley, Tn.
Chesterville, V.
Chippawa, V.
Christie, Tp.
Clara, Tp.
Clarence, Tp.
Clarendon & Miller, Tps.
Clarke, Tp.
Clifford, V.
Clinton, Tn.
Clinton, Tp.
Clyde, Tp.
Cobalt, Tn.
Cobden, V.
Cobourg, Tn.
Cochrane, Tn.
Cockburn Isld., Tp.
Colborne, Tp.
Colborne, V.
Colchester, N., Tp.
Colchester, S., Tp.
Coldwater, V.
Coleman, V.
Collingwood, Tn.
Collingwood, Tp.
Copper Cliff, Tn.

Cornwall, Tn.
Cornwall, Tp.
Courtright, V.
Cramahe, Tp.
Creemore, V.
Crosby, N., Tp.
Crosby, S., Tp.
Crowland, Tp.
Crozier, Tp.
Culross, Tp.
Cumberland, Tp.

Dack, Tp.
Dalhousie and Sherbrooke, N., Tps.
Dalton, Tp.
Darling, Tp.
Darlington, Tp.
Dawn, Tp.
Delaware, Tp.
Delhi, V.
Denbigh, Abinger, & Ashby, Tps.
Denison, Tp.
Derby, Tp.
Dereham, Tp.
Deseronto, Tn.
Digby, Tp.
Dilke, Tp.
Dorchester, N., Tp.
Dorchester, S., Tp.
Dover, Tp.
Downe, Tp.
Draper, Tp.
Drayton, V.
Dresden, Tn.
Drummond, Tp.
Drury, Denison and Graham, Tps.
Dryden, Tn.
Dudley, Tp.
Dummer, Tp.
Dumfries, N., Tp.
Dumfries, S., Tp.
Dundalk, V.
Dundas, Tn.
Dungannon, Tp.
Dunn, Tp.
Dunnville, Tn.
Dunwich, Tp.
Durham, Tn.
Dutton, V.
Dymond, Tp.
Dysart, etc., Tps.

Easthope, N., Tp.
Easthope, S., Tp.
Eastnor, Tp.
Eastview, V.
Edwardsburgh, Tp.
Effingham, Tp.
Eganville, V.
Egremont, Tp.
Ekfrid, Tp.
Elderslie, Tp.
Eldon, Tp.
Ellice, Tp.
Elma, Tp.
Elmira, V.
Elmsley, N., Tp.
Elmsley, S., Tp.
Elora, V.
Elzevir, Tp.
Embro, Tp.
Emily, Tp.
Emo, Tp.
Englehart, Tn.
Enniskillen, Tp.
Ennismore, Tp.
Eramosa, Tp.
Erin, Tp.
Erin, V.
Ernesttown, Tp.
Escott, Rear, Tp.
Esquesing, Tp.
Essa, Tp.
Essex, Tn.
Etobicoke, Tp.
Euphemia, Tp.
Euphrasia, Tp.
Exeter, V.
Eyre, Tp.

Faraday, Tp.
Fenelon, Tp.
Fenelon Falls, V.
Fergus, Tp.
Ferris, Tp.
Finch, V.
Fingal, Tp.
Fitzroy, Tp.
Flamborough, E., Tp.
Flamborough, W., Tp.
Flos, Tp.
Foley, Tp.
Forest, Tn.
Fort Erie, V.
Fort Frances, Tn.
Fort William, C.
Fraser, Tp.
Fredericksburg, S., Tp.
Fredericksburg, N., Tp.
Fullarton, Tp.

Gainsborough, Tp.
Galt, C.
Galway, Cavendish, Tp.
Gananoque, Tn.
Garafraxa, E., Tp.
Garafraxa, W., Tp.
Garden Island, Tp.
Georgetown, V.
Georgina, Tp.
Glamorgan, Tp.
Glanford, Tp.
Glencoe, Tp.
Glenelg, Tp.
Gloucester, Tp.
Goderich, Tn.
Goderich, Tp.
Gordon, Tp.
Gore Bay, Tn.
Gosfield, N., Tp.
Gosfield, S., Tp.
Goulburn, Tp.
Gower, N., Tp.
Graham, Tp.
Grand Valley, V.
Gravenhurst, Tn.
Grantham, Tp.
Grattan, Tp.
Greenock, Tp.
Grey, Tp.
Griffith, Matawachan, Tp.
Grimsby, N., Tp.
Grimsby, S., Tp.
Guelph, C.
Guelph, Tp.
Guilford, Tp.
Gwillimbury, E., Tp.
Gwillimbury, N., Tp.
Gwillimbury, W., Tp.

Hagar, Tp.
Hagarty & Richards, Tps.
Hagerman, Tp.
Hagersville, V.
Haileybury, Tn.
Haldimand, Tp.
Hallam, Tp.
Hallowell, Tp.
Hamilton, C.
Hamilton, Tp.
Hanmer, Tp.
Hanover, Tn.
Harburn, Tp.
Harcourt, Tp.
Harley, Tp.
Harris, Tp.
Harriston, Tn.
Harrow, Tp.
Harvey, Tp.
Harwich, Tp.
Hastings, V.
Havelock, Tp.
Havelock, V.
Hawkesbury, Tn.
Hawkesbury, E., Tp.
Hawkesbury, W., Tp.
Hay, Tp.
Head, Clara and Maria, Tps.
Hensall, V.
Hepworth, V.
Herschel, Tp.
Hespeler, Tn.
Hilliard, Tp.
Hillier, Tp.
Hilton, Tp.
Himsworth, N., Tp.
Himsworth, S., Tp.
Hinchinbrook, Tp.
Hindon, Tp.
Holland Landing, V.
Hope, Tp.
Horton, Tp.
Houghton, Tp.
Howard, Tp.
Howe Island, Tp.
Howick, Tp.
Howland, Tp.
Hudson, Tp.
Hullett, Tp.
Humberstone, Tp.
Humphrey, Tp.
Huntingdon, Tp.
Huntley, Tp.
Huntsville, Tn.
Huron, Tp.

Ignace, Tp.
Ingersoll, Tn.
Innisfil, Tp.
Iroquois, V.

Jaffray & Melick, Tps.
James, Tp.
Jarvis, V.
Jennings, Tp.
Jocelyn, Tp.
Johnson, Tp.
Joly, Tp.
Jones, Tp.
Kaladar, Anglesea & Effingham, Tps.
Kearney, Tn.
Keewatin, Tn.
Kemptville, V.
Kennebec, Tp.
Kenora, Tn.
Keppel, Tp.
Kerns, Tp.
Killaloe Station, V.
Kincardine, Tn.
Kincardine, Tp.
King, Tp.
Kingston, C.
Kingston, Tp.
Kingsville, Tn.
Kinloss, Tp.
Kitley, Tp.
Korah, Tp.

Lake, Tp.
Lakefield, V.
Lanark, Tp.
Lanark, V.
Lancaster, Tp.
Lancaster, V.
Latchford, Tn.
Lavallee, Tp.
Lavant, Tp.
Laxton, Digby and Longford, Tps.
Leamington, Tn.
Leeds & Lansdowne Front, Tps.
Leeds & Lansdowne Rear Tps.
Limerick, Tp.
Lindsay, Tn.
Lindsay, Tp.
Listowel, Tn.
Little Current, Tn.
Lobo, Tp.
Lochiel, Tp.
Logan, Tp.
London, C.

London, Tp.
Longford, Tp.
Longueuil, Tp.
L'Orignal, Tp.
Loughboro Tp.
Louth, Tp.
Lucan, V.
Lucknow, V.
Luther, E., Tp.
Luther, W., Tp.
Lynedock, Tp.

McClure, Tp.
McDougall, Tp.
McGillivray, Tp.
McIrvine, Tp.
McKellar, Tp.
McKillop, Tp.
McKim, Tp.
McLean & Ridout Tps.
McMurrich, Tp.
McNab, Tp.
Macaulay, Tp.
Macdonald, Meredith, etc., Tp.
Machar, Tp.
Machin, Tp.
Madoc, Tp.
Madoc, V.
Maidstone, Tp.
Malahide, Tp.
Malden, Tp.
Manvers, Tp.
Mara, Tp.

March, Tp.
Maria, Tp.
Mariposa, Tp.
Markdale, V.
Markham, Tp.
Markham, V.
Marlborough, Tp.
Marmora & Lake, Tps
Marmora, V.
Martland, Tp.
Maryborough, Tp.
Marysburgh, N., Tp.
Marysburgh, S., Tp.
Massey, Tn.
Matchedash, Tp.
Matawachan Tp.
Matilda, Tp.
Mattawa, Tn.
Mattawan, Tp.
Maxville, V.
Mays, Tp.
Meaford, Tn.
Medonte, Tp.
Medora & Wood, Tps.
Melanchthon, Tp.
Melick, Tp.
Merrickville, V.
Merritton, V.
Mersea, Tp.
Metcalfe, Tp.
Methuen, Tp.
Middleton, Tp.
Midland, Tn.
Millbrook, V.
Miller, Tp.
Milton, Tn.
Milverton, V.
Mimico, V.
Minden, Tp.
Minto, Tp.
Mitchell, Tn.
Monaghan, N., Tp.
Monaghan, S., Tp.
Monck, Tp.
Monmouth, Tp.
Mono, Tp.
Monteagle & Herschel, Tps.

Moore, Tp.
Morley, Tp.
Mornington, Tp.
Morris, Tp.
Morrisburgh, V.
Morrison, Tp.
Mosa, Tp.
Moulton, Tp.
Mount Forest, Tn.
Mountain, Tp.
Mulmur, Tp.
Murray, Tp.
Muskoka, Tp.
Nairn, Tp.
Napanee, Tn.
Neebing, Tp.
Neelon & Garson, Tps.
Nelson, Tp.
Nepean, Tp.
Nepigon, Tp.
Neustadt, V.
Newboro, V.
Newburgh, V.
Newbury, V.
Newcastle, V.
New Hamburg, V.
New Liskeard, Tn.
Newmarket, Tn.
Niagara, Tn.
Niagara, Tp.
Niagara Falls, C.
Nichol, Tp.
Nipissing, Tp.
Nissouri, W., Tp.
Normanby, Tp.
North Bay, Tn.
Norwich, N., Tp.
Norwich, S., Tp.
Norwich, V.
Norwood, V.
Nottawasaga, Tp.

Oakland, Tp.
Oakley, Tp.
Oakville, Tn.
O'Connor, Tp.
Oil Springs, V.
Olden, Tp.
Oliver, Tp.
Omemee, V.
Oneida, Tp.
Onondaga, Tp.
Ops, Tp.
Orangeville, Tn.
Orford, Tp.
Orillia, Tp.
Oro, Tp.
Oshawa, Tn.
Osnabruck, Tp.
Oso, Tp.
Osprey, Tp.
Otonabee, Tp.
Ottawa, C.
Owen Sound, Tn.
Oxford, E., Tp.
Oxford, N., Tp.
Oxford, W., Tp.
Oxford-on-Rideau, Tp

Paipoonge, Tp.
Paisley, V.
Pakenham, Tp.
Palmerston, Tn.
Palmerston, Canonto, N. & S., Tps.
Papineau, Tp.
Paris, Tn.
Parke, Tp.
Parkhill, Tn.
Parry Sound, Tn.
Peel, Tp.
Pelee Island, Tp.
Pelham, Tp.
Pembroke, Tn.
Pembroke, Tp.
Penetanguishene, Tn.
Percy, Tp.
Perry, Tp.
Perth, Tp.
Peterborough, C.
Petawawa, Tp.
Petrolea, Tp.
Pickering, Tp.
Picton, Tn.
Pilkington, Tp.
Pittsburgh, Tp.
Plantagenet, N., Tp.
Plummer, Add., Tp.
Plympton, Tp.
Point Edward, V.
Port Arthur, C.
Port Carling, V.
Port Colborn, V.
Port Dalhousie, V.
Port Dover, V.
Port Elgin, V.
Port Hope, Tn.
Port Perry, V.
Port Rowan, V.
Port Stanley, V. ..
Portland, Tp.
Portsmouth, V.
Powassan, Tn.
Prescott, Tn.
Preston, Tn.
Prince, Tp.
Puslinch, Tp.

Radcliffe, Tp.
Raglan, Tp.
Rainham, Tp.
Rainy River, Tn.
Raleigh, Tp.
Rama, Tp.
Ramsey, Tp.
Ratter & Dunnett, Tps.
Rawdon, Tp.
Rayside, Tp.
Reach, Tp.
Renfrew, Tn.
Richards, Tp.
Richmond, Tp.
Richmond Hill, V.
Richmond West, V.
Ridgetown, Tn.
Rochester, Tp.
Rockland, Tn.
Rodney, V.
Rolph, Buchanan & Wylie, Tps.
Romney, Tp.
Ross, Tp.
Roxborough, Tp.
Russell, Tp.
Ryde, Tp.
Ryerson, Tp.

St. Catharines, C.
St. Edmunds, Tp.
St. Joseph Island, Tp.
St. Mary's Tn.
St. Thomas, C.
St. Vincent, Tp.
Salter, May & Harrow, Tps.
Saltfleet, Tp.
Sandfield, Tp.
Sandwich, Tn.
Sandwich, S., Tp.
Sandwich, W., Tp.
Sarawak, Tp.
Sarnia, Tn.
Sarnia, Tp.
Saugeen, Tp.
Sault Ste. Marie, Tn.
Scarborough, Tp.
Schreiber, Tp.
Scott, Tp.
Scugog, Tp.
Seaforth, Tn.
Sebastopol, Tp.
Seneca, Tp.
Seymour, Tp.
Shallow Lake, V.
Sheffield, Tp.
Shelburne, V.
Sherborne, etc., Tp.
Sherbrooke, Tp.
Sherbrooke, N., Tp.
Sherbrooke, S., Tp.
Sherwood, Jones & Burns Tps.

Shuniah, Tp.
Sydney, Tp.
Simcoe, Tn.
Smith, Tp.
Smith's Falls, Tn.
Snowdon, Tp.
Sombra, Tp.
Somerville, Tp.
Sophiasburgh, Tp.
South River, V.
Southampton, Tn.
Southwold, Tp.
Springer, Tp.
Springfield, V.
Stafford, Tp.
Stamford, Tp.
Stanhope, Tp.
Stanley, Tp.
Stayner, Tn.
Steelton, Tn.
Stephen, Tp.
Stephenson, Tp.
Stirling, V.
Stisted, Tp.
Stormington, Tp.
Stouffville, V.
Stratford, C.
Strathroy, Tn.
Streetsville, V.
Strong, Tp.
Sturgeon Falls, Tn.
Sturgeon Point, V.
Sudbury, Tn.
Sullivan, Tp.
Sundridge, V.
Sunnidale, Tp.
Sutton, V.
Sydenham, Tp.

Tara, V.
Tarentorus, Tp.
Tavistock, V.
Tay, Tp.
Teeswater, V.
Tecumseth, Tp.
Tehkummah, Tp.
Thamesville, V.
Thedford, V.
Thessalon, Tn.
Thessalon, Tp.
Thompson, Tp.
Thornbury, Tn.
Thorold, Tn.
Thorold, Tp.
Thurlow, Tp.
Tilbury, Tn.
Tilbury, E., Tp.
Tilbury, N., Tp.
Tilbury, W., Tp.
Tillsonburg, Tn.
Tiny, Tp.
Tisdale, Tp.
Tiverton, V.
Torbolton, Tp.
Toronto, C.
Toronto, Tp.
Toronto, Gore, Tp.
Toronto, North, Tn.
Tossorontio, Tp.
Townsend, Tp.
Trafalgar, Tp.
Trenton, Tn.
Tuckersmith, Tp.
Tudor & Cashell, Tp.
Turnbury, Tp.
Tweed, V.
Tyendinaga, Tp.

Usborne, Tp.
Uxbridge, Tn.
Uxbridge, Tp.

Van Horne, Tp.
Vankleek Hill, Tn.
Vaughan, Tp.
Verulam, Tp.
Vespra, Tp.
Wainfleet, Tp.
Walkerton, Tn.
Walkerville, Tn.
Wallace, Tp.
Wallaceburg, Tn.
Walpole, Tp.
Walsington, N., Tp.
Walsingham, S., Tp.
Wardsville, V.
Warwick, Tp.
Waterford, Tp.
Waterloo, Tn.
Waterloo, Tp.
Watford, V.
Waters, Tp.
Watt, Tp.
Wawanosh, E., Tp.
Wawanosh, W., Tp.
Welland, Tp.
Webbwood, Tn.
Wellesley, Tp.
Wellington, V.
West Lorne, V.
Westmeath, Tp.
Westminster, Tp.
Weston, V.
Westport, V.
Whitby, Tn.
Whitby, Tp.
Whitby, E., Tp.

Whitchurch, Tp.
Wiarton, Tn.
Wicklow, Tp.
Widdifield, Tp.
Wilberforce and Algona, N., Tps.
William, E., Tp.
Williamsburg, Tp.
Willoughby, Tp.
Wilmot, Tp.
Winchester, Tp.
Winchester, V.
Windham, Tp.
Windsor, C.
Wingham, Tn.
Wolfe Island, Tp.
Wolford, Tp.
Wollaston, Tp.
Wood, Tp.
Woodbridge, V.
Woodhouse, Tp.
Woodstock, C.
Woodville, V.
Woolwich, Tp.
Worthington & Blue, Tps.
Wroxeter, V.
Wylie, Tp.
Wyoming, V.

Yarmouth, Tp.
Yonge, Front, Tp.
Yonge and Escott, Rear, Tps.
York, Tp.

Zone, Tp.
Zorra, E., Tp.
Zorra W., Tp.

REPORTS FROM MUNICIPAL CLERKS.

ABERDEEN, Tp.—See Macaulay, Meredith and Aberdeen Tps.

ABINGER, Tp.—See Denbigh, Abinger and Ashby Tps.

ACTON, V.—Owns and operates electric light plant, cost $10,000. Good openings for boot and shoe factory, cheese factory, creamery. Number of buildings erected 10; cost $1,000. Amount expended on permanent improvements, $1,700. A. J. McKinnon, Village Clerk, Acton.

ADELAIDE, Tp.—Number of buildings erected, 30; cost $15,000. Amount expended on permanent improvements, $7,000. H. J. Miller, Township Clerk, Adelaide.

AILSA CRAIG, V.—No public utilities, but passed a hydro-electric by-law. Good openings for brick yard, field tile, cement blocks and tile. One new building erected, cost $2,500. Amount expended on permanent improvements, $500. Amount expended on sanitation, $120. E. B. Smith, Village Clerk, Ailsa Craig.

ADJALA, Tp.—Number of buildings erected, 4; cost $5,500. Amount expended on permanent improvements, $1,828. F. Kelly, Township Clerk, Loretto.

ADMASTON, Tp.—Number of buildings erected, 5; cost $3,500. Amount expended on permanent improvements, $748. R. W. Brown, Township Clerk, Admaston Station.

Adolphustown, Tp.—Good opening for canning factory and brick and tile yards. Amount expended on permanent improvements, $210. D. W. Roblin, Township Clerk, Parma.

Albermarle, Tp.—Owns and operates waterworks, cost $1,000. Amount expended on permanent improvements, $1,910. C. E. Whicher, Township Clerk, Colpot's Bay.

Alberton, Tp.—Saw mill started. Number of buildings erected, 3; cost $2,500. Amount expended on permanent improvements, $2,500. F. H. Warner, Township Clerk, Crozier.

Albion, Tp.—Number of buildings erected, 6; cost $6,000. Amount expended on permanent improvements, $5,000. Robert Matson, Township Clerk, Palgrave.

Aldborough, Tp.—Good opening for fruit growing and market garden. Number of buildings erected, 20; cost $20,000. Amount expended on permanent improvements, $5,000. E. A. Hugill, Township Clerk, Rodney.

Alexandria, Tn.—Owns and operates waterworks and lighting plant, cost $47,000. Number of buildings erected, 10; cost, $15,000. Amount expended on permanent improvements, $5,572. Amount expended on sanitation, $150. S. Macdonald, Town Clerk, Alexandria.

Alfred, Tp.—New peat works started. Number of buildings erected, 20; cost $10,000. Amount expended on permanent improvements, $1,885. B. G. Parisien, Township Clerk, Alfred.

Algona N. Tp.—See Wilberforce and Algona N. Tps.

Algona, S., Tp.—Good opening for saw mill. One new building erected; cost $125. Amount expended on permanent improvements, $10. Amount expended on sanitation, $16. John P. Nelan, Township Clerk, Castile.

Alice and Fraser, Tps.—Good opening for cheese factory. Number of buildings erected, 19; cost $4,100. Amount expended on permanent improvements, $317. J. M. Kennedy, Township Clerk, Pembroke.

Alliston, Tn.—Silver plating factory started. Owns and operates waterworks, cost $20,000. Good opening for woodenware factory and fuel factory. number of buildings erected, 4; cost $6,000. Amount expended on permanent improvements, $3,000. Amount expended on sanitation, $200. W. M. Lockhart, Town Clerk, Alliston.

Almonte, Tn.—Owns and operates electric light plant, cost $40,000. Good opening for any industry using water power. Number of buildings erected, 4; cost $30,000. Amount expended on permanent improvements, $4,000. Amount expended on sanitation, $200. J. T. Kirkland, Town Clerk, Almonte.

Alnwick, Tp.—Number of buildings erected, 3; cost $1,400. Amount expended on permanent improvements, $500. John McMillan, Township Clerk, Roseneath.

Alvinston, V.—Good opening for furniture factory, sugar factory, etc. Number of buildings erected, 2; cost $2,500. Amount expended on sanitation, $255. John Irving, Village Clerk, Alvinston.

Amabel, Tp.—Number of buildings erected, 3; cost $1,000. Amount expended on permanent improvements, $2,500. R. H. Murray, Township Clerk, Allenford.

Amaranth, Tp.—Amount expended on permanent improvements, $3,500. E. Hamilton, Township Clerk, Laurel.

AMELIASBURG, Tp.—Good opening for canning factory. Number of buildings erected, 6; cost $6,000. Amount expended on permanent improvements, $1,393. Amount expended on sanitation, $37. F. C. File, Township Clerk, Ameliasburg.

AMHERST ISLAND, Tp.—Amount expended on permanent improvements, $200. Wm. H. Moutray, Township Clerk, Stella.

AMHERSTBURG, Tn.—Owns and operates waterworks, value $40,000; street lighting, value $4,500. Good opening for automobile factories. Number of buildings erected, 8; cost $50,000. Amount expended on permanent improvements, $1,000. Amount expended on sanitation, $800. Gordon E. Pulford, Town Clerk, Amherstburg.

ANCASTER, Tp.—Number of buildings erected, 30; cost $25,000. Amount expended on permanent improvements, $3,597. Amount expended on sanitation, $143. Henry Pim, Township Clerk, Ancaster.

ANDERDON, Tp.—Good opening for automobile factory. Number of buildings erected, 4; cost $4,800. Amount expended on permanent improvements, $1,959. A. C. Mailloux, Township Clerk, Gordon.

ANGLESEA, Tp.—See Kaladar, Anglesea and Effingham Tps.

ANSON and HINDON, Tps.—Good opening for saw mill. No new buildings erected. Amount expended on permanent improvements, $700. Wm. A. Welch, Township Clerk, Minden.

ANSTRUTHER, Tp.—See Burleigh and Anstruther Tps.

APPLEBY, Tp.—See Casimer, Jennings and Appleby Tps.

ARCONA, V.—Good opening for canning factories. No new buildings erected. Amount expended on sanitation, $75. J. Geo. Brown, Village Clerk, Arkona.

ARMOUR, Tp.—Number of buildings erected, 3; cost $1,800. Amount expended on permanent improvements, $1,332. Amount expended on sanitation, $16. J. N. Dodds, Township Clerk, Burk's Falls.

ARNPRIOR, Tn.—Box factory and cheese boxes from wood fibre factory started. Owns and operates waterworks, cost $118,300. Good opening for foundry, woodworking industries, knitting factory, grist mill; electric power is available. Number of buildings erected, 11; cost $35,000. Amount expended on permanent improvements, $110,727. Amount expended on sanitation, $2,833. Trevor H. Grout, Town Clerk, Arnprior.

ARRAN, Tp.—Number of buildings erected, 5; cost $5,000. Amount expended on permanent improvements, $4,651. Amount expended on sanitation, $66. H. T. Potts, Township Clerk, Dumblane.

ARTEMESIA, Tp.—Good openings for manufacture of brick, machine shop, cheese factory, sash and door factory and furniture factory. Number of buildings erected, 13; cost $15,000. Amount expended on permanent improvements, $2,687. Amount expended on sanitation, $10. W. J. Bellamy, Township Clerk, Flesherton.

ARTHUR, Tp.—Number of buildings erected, 6; cost $7,000. Amount expended on permanent improvements, $3,500. Albert Hellyer, Township Clerk, Kenilworth.

ARTHUR, V.—Good opening for boot and shoe factory. No new buildings erected. Amount expended on permanent improvements, $2,000. Amount expended on sanitation, $30. D. T. Small, Village Clerk, Arthur.

ASHBY, Tp.—See Denbigh, Abinger and Ashby Tps.

ASHFIELD, Tp.—No new buildings erected. Amount expended on permanent improvements, $3,107. Amount expended on sanitation, $16. Thomas G. Allen, Township Clerk, Dungannon.

Asphodel, Tp.—Number of buildings erected, 2; cost $3,000. Amount expended on permanent improvements, $1,500. John Brackenbridge, Township Clerk, Westwood.

Assiginack, Tp.—Good opening for waterworks. Number of buildings erected, 3; cost $900. Amount expended on permanent improvements, $2,563. Amount expended on sanitation, $8. G. W. Cragg, Township Clerk, Manitowaning.

Athens, V.—One new building erected; cost $2,000. G. F. Donnelly, Clerk, Athens.

Athol, Tp.—Good opening for canning factory. Number of buildings erected, 5; cost $8,000. Amount expended on permanent improvements, $1,700. W. Moore, Township Clerk.

Atwood, Tp.—Good opening for flour mills and stave mill. Number of buildings erected, 3; cost $1,800. Amount expended on permanent improvements, $1,100. Hugh Carson, Township Clerk, Rainy River.

Augusta, Tp.—Number of buildings erected, 8; cost $6,600. Amount expended on permanent improvements, $5,000. John Mellafont, Township Clerk, Algonquin.

Aurora, Tn.—Owns and operates waterworks, cost $35,000. Good opening for industries of any kind. Number of buildings erected, 30; cost $50,000. Amount expended on permanent improvements, $6,000. Amount expended on sanitation, $600. S. H. Lundy, Town Clerk, Aurora.

Aylmer, Tn.—Garage and automobile repair shop started. Owns and operates waterworks system, cost $100,000; electric light plant, cost $35,000. Number of buildings erected, 8; cost $17,000. Amount expended on permanent improvements, $13,000. D. C. Davis, Town Clerk, Aylmer.

Ayr, V.—Openings for any kind of industries. Number of buildings erected, 1; cost $3,500. Amount expended on permanent improvements, $3,572. A. J. Reid, Village Clerk, Ayr.

Bagot and Blythfield, Tps.—Good openings for shingle and planing mill, smelter for iron and flour mill. Number of buildings erected, 3; cost $3,500. J. J. Dillon, Township Clerk, Calabogie.

Balfour, Tp.—Good openings for woollen or flour mills. No new buildings erected. Amount expended on permanent improvements, $505. J. A. Bastien, Township Clerk, Chelmsford.

Bancroft, V.—Good opening for pulp mill. No new buildings erected. Amount expended on permanent improvements, $500. J. A. Eby, Village Clerk, Bancroft.

Bangor, Wicklow and McClure, Tps.—Good opening for woollen mills. Number of buildings erected, 10; cost $5,000. Amount expended on permanent improvements, $500. D. C. Carswell, Township Clerk, Maynooth.

Barrie, Tn.—Owns and operates waterworks, cost $123,389; electric light plant, cost $85,675. Good openings for tannery, shoe factory, woollen mills, whitewear factory, knitting factory, corset factory, furniture factory and canning factory. Number of buildings erected, 21; cost $48,000. Amount expended on permanent improvements, $5,800. Amount expended on sanitation, $8,475. E. Donnell, Town Clerk, Barrie.

Barrie, Tp.—No new buildings erected. Amount expended on permanent improvements, $151. W. P. Maynard, Township Clerk, Cloyne.

Barton, Tp.—Number of buildings erected, about 50; cost $50,000. Amount

expended on permanent improvements, $9,582. Amount expended on sanitation, $292. A. G. E. Bryant, Township Clerk, Mount Hamilton.

Bastard and Burgess S., Tps.—Amount expended on permanent improvements, $1,660. Amount expended on sanitation, $69. W. J. Birch, Township Clerk, Delta.

Bath, V.—Owns and operates lighting system, value about $225. Good opening for canning factory. Number of buildings erected, 4; cost about $4,000. Amount expended on permanent improvements, $380. Amount expended on sanitation, $10. E. P. Shephard, Village Clerk, Bath.

Bathurst, Tp.—Number of buildings erected, 24; cost $15,000. Amount expended on permanent improvements, $397. Amount expended on sanitation, $32. R. M. Anderson, Township Clerk, Manion.

Bayfield, V.—Good opening for flax mill. One new building erected; cost $3,000. Amount expended on permanent improvements, $659. H. W. Erwin, Village Clerk, Bayfield.

Bayham, Tp.—Good openings for canning factory, steel works. No new buildings erected. Amount expended on permanent improvements, $8,000. Benj. Brian, Township Clerk, Straffordshire.

Beamsville, V.—Owns and operates waterworks, cost $27,000. Good openings for box and canning factories. Number of new buildings erected, 8; cost $17,000. Amount expended on permanent improvements, $200. S. B. Bisbee, Village Clerk, Beamsville.

Beaverton, V.—Good opening for canning factory and other industries. Number of buildings erected, 2; cost $3,500. Amount expended on permanent improvements, $647. Amount expended on sanitation, $27. C. A. Paterson, Village Clerk, Beaverton.

Beckwith, Tp.—No new buildings erected. Amount expended on permanent improvements, $1,254. Amount expended on sanitation, $12. J. W. Robertson, Township Clerk, Carleton Place.

Bedford, Tp.—Good opening for general merchant at Fermoy. Number of buildings erected, 6; cost $6,000. Amount expended on permanent improvements, $1,300. James McNeil, Township Clerk, Burridge.

Beeton, V.—New fanning mill factory started. Owns and operates waterworks, cost $14,500; value, $20,000; electric light plant, cost $5,000; value about $4,000. Good openings for sash and door and carriage factories. Number of buildings erected, 2; cost about $4,000. Amount expended on permanent improvements, $1,000. Jos. Wright, Village Clerk, Beeton.

Belle River, V.—Good opening for any kind of industries. Number of buildings erected, 2; cost about $3,600. Amount expended on permanent improvements, $500. L. Ducharme, Village Clerk, Belle River.

Belleville, C.—Skewer and dowell factory started. Owns and operates waterworks, cost $192,000. Gas works, cost $90,000. Openings for all kinds of industries. Number of buildings erected, 65; cost $300,000. Amount expended on permanent improvements, $64,000; amount expended on sanitation, $70,000. W. C. Mikel, City Clerk, Belleville.

Belmont and Methuen, Tps.—Number of buildings erected, 5; cost about $5,500. Amount expended on permanent improvements, $1,985. W. H. Johnston, Township Clerk, Havelock.

Bentinck, Tp.—Electric power plant started. Number of buildings erected,

14; cost $19,000. Amount expended on permanent improvements, $1,000. J. Herbert Chittick, Township Clerk, Lamlash.

Berlin, C.—Fountain pens, pork packing, paper boxes, shirts and collars, go-carts and furniture industries started. Owns and operates waterworks system, cost $260,765; gas and electric light plant, cost $398,586; street railway, cost $135,193. Good openings for industries of any character. Number of buildings erected, 197; cost $364,693. Amount expended on permanent improvements, $65,062. Amount expended on sanitation, $16,204. A. H. Millar, City Clerk, Berlin.

Bertie, Tp.—Openings for various industries. Number of buildings erected, 25; cost $30,000. Amount expended on permanent improvements, $4,974. Amount expended on sanitation, $291. M. S. Pound, Township Clerk, Ridgeway.

Beverly, Tp.—Number of buildings erected, 6; cost $7,100. Amount expended on permanent improvements, $2,496. Wm. Wood, Jr., Township Clerk, Rockton.

Bexley, Tp.—Good opening for lime kiln. One new building erected, cost $475. Amount expended on permanent improvements, $1,300. Alfred Taylor, Township Clerk, Victoria Road.

Biddulph, Tp.—Good opening for any kind of industries. Amount expended on permanent improvements, $7,024. Amount expended on sanitation, $251. W. D. Stanley, Township Clerk, Granton.

Billings, Tp.—Planing mill and sash and door factory started. Amount expended on permanent improvements, $1,500. W. M. Boyd, Township Clerk, Kakawong.

Binbrook, Tp.—Number of buildings erected, 10; cost $6,000. Amount expended on permanent improvements, $2,183. W. B. Switzer, Township Clerk, Binbrook.

Blandford, Tp.—Number of buildings erected, 2; cost $7,000. Amount expended on permanent improvements, $1,791. Amount expended on sanitation, $81. W. G. Henderson, Township Clerk, Bright.

Blanshard, Tp.—Number of buildings erected, 11; cost $15,000. Amount expended on permanent improvements, $7,000. John H. Jameson, Township Clerk, Rannoch.

Blenheim, Tn.—Owns and operates electric light system, cost $12,500. Good opening for canning factory. Number of buildings erected, 2; cost $6,000. P. S. Shillington, Town Clerk, Blenheim.

Blenheim, Tp.—Number of buildings erected, 11; cost $13,000. Amount expended on permanent improvements, $7,212. Hugh Allen, Township Clerk, Drumbo.

Blezard, Tp.—Good opening for butter or cheese factory. Number of buildings erected, 2; cost $900. Amount expended on permanent improvements, $71. G. Bonin, Township Clerk, Blezard Valley.

Blind River, Tn.—Good opening for lumber mills. Number of buildings erected, 6; cost $5,000. Amount expended on permanent improvements, $1,210. J. A. Hawkins, Town Clerk, Blind River.

Bloomfield, V.—Openings for small industries using steam power. No new buildings erected. Amount expended on permanent improvements, $3,000. C. H. Saylor, Village Clerk, Bloomfield.

Blue, Tp.—See Worthington and Blue Tps.

Blyth, V.—Saw mill and manufacture of wooden rollers started. Owns

and operates electric light plant and 750 gallon waterworks, pump for fire protection, value $8,000. Good openings for salt works, foundry, and knitting factory. Number of buildings erected, 2; cost $3,500. Amount expended on permanent improvements, $300. A. Elder, Village Clerk, Blyth.

Blythfield, Tp.—See Bagot and Blythfield Tps.

Bobcaygeon, V.—Owns and operates electric light plant, cost $25,000. Good openings for industries using wood or limestone. Number of buildings erected, 3; cost $4,000. Amount expended on permanent improvements, $750. Chas. E. Stewart, Village Clerk, Bobcaygeon.

Bolton, V.—Good opening for steam laundry. Number of buildings erected, 3; cost $7,000. Amount expended on permanent improvements, $500. Amount expended on sanitation, $75. John McDonald, Village Clerk, Bolton.

Bonfield, Tn.—Number of buildings erected, 3; cost $1,600. Amount expended on permanent improvements, $133. Amount expended on sanitation, $6. H. E. Lemieux, Town Clerk, Bonfield.

Bonfield, Tp.—Saw mill started. Openings for stave mill, sash and door factory, cheese or butter factory, grist mill, woollen mill and brick factory. Number of buildings erected, 10; cost $4,000. Amount expended on permanent improvements, $476. Amount expended on sanitation, $10. M. R. Dunn, Township Clerk, Rutherglen.

Bosanquet, Tp.—Amount expended on permanent improvements, $4,409. George Sutherland, Township Clerk, Thedford.

Bothwell, Tn.—Owns and operates waterworks, cost $4,500; electric light plant, cost $6,000. Good opening for canning factory. Number of buildings erected, 3; cost $9,000. W. G. Bradley, Town Clerk, Bothwell.

Bowmanville, Tn.—Extension of Tire and Rubber Co. Good opening for any kind of industries. Number of buildings erected, 3; cost $45,000. Amount expended on permanent improvements, $2,700. Amount expended on sanitation, $100. John Lyle, Town Clerk, Bowmanville.

Bracebridge, Tn.—Launch work started. Owns and operates waterworks and electric light and power plants, cost $163,000. Good openings for chemical works and upper leather tannery. Number of buildings erected, 4; cost $3,000. amount expended on permanent improvements, $5,916. Amount expended on sanitation, $105. Alex. C. Salmon, Town Clerk, Bracebridge.

Bradfort, V.—One new building erected; cost $2,000. Amount expended on permanent improvements, $650. Robert Stewart, Village Clerk, Bradford.

Brampton, Tn.—Owns and operates waterworks, cost $70,000; hydro-electric system, cost $55,000. Good opening for any kind of industries. Number of buildings erected, 30; cost about $50,000. Amount expended on permanent improvements, $16,500. Amount expended on sanitation, $1,300. W. H. McFadden, Town Clerk, Brampton.

Brant, Tp.—Number of buildings erected, 10; cost $11,000. Amount expended on permanent improvements, $8,000. M. A. McCallum, Township Clerk, Malcolm.

Brantford, C.—Engine works, machine and motor company, stoves, and stationery started. Owns and operates waterworks, cost $512,311. Good openings and aid for industries. Number of buildings erected, 531, cost $613,860. Amount expended on permanent improvements, $80,163. Amount expended on sanitation, $67,671. H. F. Leonard, City Clerk, Brantford.

Brantford, Tp.—Openings for various industries. Number of buildings

erected, 130; cost $173,000. Amount expended on permanent improvements, $1,300. J. A. Smith, Township Clerk, Brantford.

Bridgeburg, V.—Owns and operates waterworks, cost $52,000. Opening for brick yard. Number of buildings erected 10; cost $20,000. Amount expended on permanent improvements $2,300. Amount expended on sanitation $20,659. R. A. Land, Village Clerk, Bridgeburg.

Brighton Tp.—Good opening for any industries requiring water power. Number of buildings erected 3; cost $3,000. Amount expended on permanent improvements $2,100. Fred. A. Wade, Township Clerk, Brighton.

Brighton, V.—Lime and sulphur spray industry started. Good opening for any kind of industries. Number of buildings erected 5; cost $10,000. Amount expended on permanent improvements $2,000. Amount expended on sanitation $500. T. C. Lockwood, Village Clerk, Brighton.

Brock, Tp.—Number of buildings erected 6; cost $16,000. Amount expended on permanent improvements $9,430. Amount expended on sanitation $240. Frank Doble, Township Clerk, Sunderland.

Brockville, Tn.—Baking powder and automobile industries started. Owns and operates waterworks, cost $262,693; gas, $113,270; electric lighting plant $103,255. Good opening for any kind of industries. Number of buildings erected 30; cost $157,900. Amount expended on permanent improvement $8,279. Amount expended on sanitation $1,264. Geo. K. Dewey, Town Clerk, Brockville.

Bromley, Tp.—Openings for industries of any character. Number of buildings erected 3; cost $3,000. Amount expended on permanent improvements, $5,000. J. D. Walsh, Township Clerk, Osceola.

Brooke, Tp.—Good opening for brick and tile making. Number of buildings erected 10; cost $20,000. Amount expended on permanent improvements, $5,414. Amount expended on sanitation $26. W. G. Willoughby, Township Clerk, Watford.

Brougham, Tp.—No new buildings erected. Amount expended on permanent improvements $150. Michael Sheedy, Township Clerk, Mt. St. Patrick.

Bruce, Tp.—Municipal telephone system under construction. Good opening for summer resorts on Lake Huron. Number of buildings erected 24; cost $11,500. Amount expended on permanent improvements $5,082. J. G. MacKay, Township Clerk, Underwood.

Bruce Mines, Tn.—Good opening for stone quarries. No new buildings erected. Amount expended on permanent improvements $494. Thos. Sullivan, Town Clerk, Bruce Mines.

Brudenell and Lynedoch, Tps.—Number of buildings erected 4; cost $600. Amount expended on permanent improvements $40. Jas. P. Whelan, Township Clerk, Brudenell.

Brunel, Tp.—Opening for saw and shingle mill. Number of buildings erected 3; cost $1,000. Amount expended on permanent improvements $1,100. Henry Farnsworth, Township Clerk, Huntsville.

Bruton, Tp.—See Dysart, etc., Tps.

Brussels, V.—Opening for foundry and machine shop. One building erected, cost about $3,500. Amount expended on permanent improvements $109. F. S. Scott, Village Clerk, Brussels.

Buchanan Tp.—See Wolfe, Buchanan and Wylie Tps.

Burford, Tp.—Openings for industries of any character. Number of buildings erected 20; cost $20,000. Amount expended on construction and permanent

improvements $7,000; also 4,000 days statute labour. Phil. Kelly, Township Clerk, New Durham.

Burgess S., Tp.—See Bastard and Burgess, S., Tps.

Burgess, N., Tp.—Number of buildings erected about 10 silos; cost about $100 each. Amount expended on permanent improvements $150. R. T. Noonan, Township Clerk, Stanleyville.

Burks Falls, V.—Owns and operates waterworks, cost $37,000. Good opening for any industry requiring water power. Number of buildings erected 5; cost $6,400. Amount expended on permanent improvements $112,992. Chas. McArthur, Village Clerk, Burks Falls.

Burleigh and Anstruther, Tps.—Number of buildings erected 5; cost $1,550. Amount expended on permanent improvements $71. Wm. Gallon, Township Clerk, Apsley.

Burlington, V.—Owns and operates waterworks, cost $60,000. Number of buildings erected 27; cost $48.000. Amount expended in permanent improvements $13,400. Amount expended on sanitation $1,996. O. T. Springer, Village Clerk, Burlington.

Burpee, Tp.—No new buildings erected. Amount expended on permanent improvements $300. Norman Bailey, Township Clerk, Evansville.

Cache Bay, Tn.—Openings for general store and steam grist mill. Number of buildings erected 3; cost $2,000. Amount expended on permanent improvements $699. Amount expended on sanitation $45. Fred. Schroeder, Town Clerk, Cache Bay.

Caistor, Tp.—Number of buildings erected 15; cost $10,000. Amount expended on permanent improvements $2,500. Albert Shields, Township Clerk, Caistorville.

Cardwell, Tp.—Number of buildings erected 4; cost $4,500. Amount expended on permanent improvements $4,000. Ed. Beaudoin, Township Clerk, Verner.

Caledon, Tp.—Number of buildings erected 6; cost $11,000. Amount expended on permanent improvements $3,000. J. L. Meek, Township Clerk, Alton.

Caledonia, Tp.—Good opening for peat plant. Number of buildings erected 5; cost $10,000. Amount expended on permanent improvements $1,000. Amount expended on sanitation $150. R. L. Downing, Township Clerk, Routhier.

Caledonia, V.—Number of buildings erected 12; cost $25,000. Amount expended on permanent improvements $23,000. Amount expended on sanitation $200. F. W. Young, Village Clerk, Caledonia.

Cambridge, Tp.—Amount expended on permanent improvements $3,290. J. B. Sanche, Township Clerk, Casselman.

Camden, Tp.—Good opening for tile yards and creameries. Number of buildings erected 10; cost $10,000. Amount expended on permanent improvements $2,500. M. S. Blackburn, Township Clerk, Dresden.

Camden, E., Tp.—Number of buildings erected 7; cost $14,000. Amount expended on permanent improvements $3,000. T. E. McGill, Township Clerk, Centreville.

Cameron, Tp.—Good opening for saw mill, grist mill, paper mill. Number of buildings erected 3; cost $1,800. Amount expended on permanent improvements $1,500. S. J. McMeakin, Township Clerk, Mattawa.

Campbellford, Tn.—Pulp mill started. Owns and operates electric power and water plant; cost $160,000. Good openings for manufacturing industries of every description. Number of buildings erected 50; cost $50,000. Amount

expended on permanent improvements $5,000. Amount expended on sanitation $30,000. E. C. West, Town Clerk, Campbellford.

Canborough, Tp.—Amount expended on permanent improvements $665. Amount expended on sanitation $9. Donald McCallum, Township Clerk, Canboro' P. O.

Cannington, V.—Factory of automobile bodies started. Openings for industries of any character. One building erected; cost $9,000. Amount expended on permanent improvements $1,325. Amount expended on sanitation $3,360. W. Robinson, Village Clerk, Cannington.

Canonto, N., Tp.—See Palmerston and N. and S. Canonto Tps.

Canonto, S., Tp.—See Palmerston and N. and S. Canonto Tps.

Caradoc, Tp.—Number of buildings erected 100; cost . Amount expended on permanent improvements $15,000. F. A. Lockwood, Township Clerk, Mt. Brydges.

Carden, Tp.—Number of buildings erected 3; cost $3,000. Amount expended on permanent improvements $476. John Walsh, Township Clerk, Kirkfield.

Cardiff, Tp.—Good opening for hardwood notion factory or stave factory. number of buildings erected 4; cost $1,600. Amount expended on permanent improvements $85. Alfred G. Tate, Township Clerk, Highland Grove.

Cardinal, V.—Openings for industries of any character. Number of buildings erected 3; cost $10,000. Amount expended on permanent improvements $800. M. Kavanagh, Village Clerk, Cardinal.

Cardwell, Tp.—Number of buildings erected 3; cost $5,000. Amount expended on permanent improvements $635 (exclusive of statute labour). M. Wilson, Township Clerk, Rosseau.

Carleton Place, Tn.—Good openings for woollen, furniture and machinery factories. Number of buildings erected 9; cost $40,000. Amount expended on permanent improvements $4,791. A. R. G. Pedan, Town Clerk, Carleton Place.

Carling, Tp.—Number of buildings erected 3; cost $1,235. Amount expended on permanent improvements, statute labour. J. D. Broughton, Township Clerk, Parry Sound.

Carlow, Tp.—Good openings for iron and corundum mills and refineries, sash and door factories, and for butchers and carpenters. Number of buildings erected 2; cost $2,200. Amount expended on permanent improvements $650. Amount expended on sanitation $7. J. E. Greaves, Township Clerk, Fort Stewart.

Carrick, Tp.—Good opening for foundry and furniture factory. Number of buildings erected 20; cost $26,000. Amount expended on permanent improvements $3,000. Amount expended on sanitation $68. J. A. Johnston, Township Clerk, Mildmay.

Cartwright, Tp.—Number of buildings erected 10; cost $7,700. Amount expended on permanent improvements $1,285. Amount expended on sanitation $96. Wm. Beacock, Township Clerk, Caesarea.

Casey, Tp.—Good opening for saw mill. Number of buildings erected 5; cost $665. Amount expended on permanent improvements $1,993. Hugh Keats, Township Clerk, Judge.

Casselman, V.—Owns and operates fire engine; cost $5,000. Number of buildings erected 6; cost $3,000. Amount expended on permanent improvements, $657. Amount expended on sanitation $186. Joseph Martin, Village Clerk, Casselman.

Cassimer, Jennings and Appelby, Tps.—Good opening for woollen mill.

Number of buildings erected 10; cost $3,000. Amount expended on permanent improvements $750. Joseph Levert, Township Clerk, St. Charles.

CAVAN, Tp.—Good opening for cheese factory. Number of buildings erected 8; cost $3,700. Amount expended on permanent improvements $6,749. Amount expended on sanitation $29. J. J. Fair, Township Clerk, Millbrook.

CAVENDISH, Tp.—See Galway and Cavendish Tps.

CAYUGA, V.—Cement, brick and tile industry started. Good opening for canning factory, brick yard and pickle factory. There is good concrete factory building, 40 x 120, available for any industry. Number of buildings erected 2; cost $8,000. J. W. Sheppard, Village Clerk, Cayuga.

CAYUGA, N., Tp.—Number of buildings erected 8; cost $10,000. Amount expended on permanent improvements $625. W. Teasdale, Township Clerk, Cayuga.

CAYUGA, S., Tp.—Number of buildings erected 2; cost $2,500. Amount expended on permanent improvements $350. Jas. W. Caughell, Township Clerk, Cayuga South.

CHAFFEY, Tp.—Number of buildings erected 6; cost $3,000. Amount expended on permanent improvements, $1,500. Uriah Hardy, Township Clerk, Huntsville.

CHAMBERLAIN, Tp.—Amount expended on permanent improvements, $2,891. W. C. Morham, Township Clerk, Wawbewawa.

CHANDOS, Tp.—Number of buildings erected 4; cost $600. Amount expended on permanent improvement $165. Amount expended on sanitation $112. Levi P. Bullied, Township Clerk, Lasswade.

CHAPLEAU, Tp.—Owns and operates waterworks; cost $40,094. Good opening for pulp mills. Number of buildings erected 6; cost $31,000. Amount expended on permanent improvements $7,528. T. J. Godfrey, Township Clerk, Chapleau.

CHAPMAN, Tp.—Good openings for furniture factory, sash and door factory, woollen mill, with power available. Number of buildings erected 5; cost $2,500. Amount expended on permanent improvements $2,005. Amount expended on sanitation $5. Harry Q. Snuggs, Township Clerk, Magnetawan.

CHAPPLE, Tp.—Saw mill started. Number of buildings erected 4; cost $3,000. Amount expended on permanent improvements $4,918. Amount expended on sanitation $509. Everett Kernahan, Township Clerk, Barwick.

CHARLOTTENBURG, Tp.—Number of buildings erected, 10; cost $20,000. Amount expended on permanent improvements, $7,579. Amount expended on sanitation, $393. W. A. Watson, Township Clerk, Williamstown.

CHARLOTTEVILLE, Tp.—Good openings for various industries, with water power and natural gas. Amount expended on permanent improvements $1,850. Amount expended on sanitation $37. R. W. McCall, Township Clerk, Vittoria.

CHATHAM, C.—Malleable iron works, pad and textile works, bridge works started. Extensive improvements and extensions to International Harvester works and carriage and waggon works. Owns and operates waterworks: cost $225,000; electric light plant: $23,500. Good opening for sugar beet plant, glass factory, implement factory, etc. Number of buildings erected 84; cost $355,147. Amount expended on permanent improvements $26,979. Amount expended on sanitation $6,573. W. G. Merritt, City Clerk, Chatham.

CHATHAM, Tp.—Opening for brick and tile yard. Number of buildings

erected 12; cost $70,000. Amount expended on permanent improvements $1,500. A. McArthur, Township Clerk, Tupperville.

CHATSWORTH, V.—No new buildings erected. Amount expended on permanent improvements $102. Amount expended on sanitation $6. W. G. Reilly, Village Clerk, Chatsworth.

CHELMSFORD, Tn.—Openings for industries of any character. Number of buildings erected 5; cost $2,000. Amount expended on permanent improvements $400. H. J. Gratton, Town Clerk, Chelmsford.

CHESLEY, Tn.—Owns and operates waterworks; value $42,320. Good opening for furniture factory. No new buildings erected. Amount expended on permanent improvements $762. Amount expended on sanitation $300. Wm. McDonald, Town Clerk, Chesley.

CHESTERVILL, V.—Good opening for sash and door factory. No new buildings erected. Amount expended on sanitation $500. T. T. Shaw, Village Clerk, Chesterville.

CHINQUACOUSY, Tp.—Owns and operates telephone system, cost $30,000. Number of buildings erected, 7; cost $11,100. Amount expended on permanent improvements, $15,000. Robert Kee, Township Clerk, Cheltenham.

CHIPPAWA, V.—Owns and operates electric light system, cost $600. Good openings for industries of any character. Number of buildings erected, 4; cost, $5,800. Amount expended on permanent improvements, $1,000. W. A. Myer, Village Clerk, Chippawa.

CHRISTIE, Tp.—Good openings for industries requiring hard or soft timber. Number of buildings erected, 4; cost $4,000. Amount expended on permanent improvements, $500. Wells Thompson, Township Clerk, Orrville.

CLARA, Tp. See Head, Maria and Clara Tps.

CLARENCE, Tp.—Brick factory started. New buildings erected, 200; cost $36,000. Amount expended on permanent improvements, $3,850. Amount expended on sanitation, $600. J. A. Menard, Township Clerk, Bourget.

CLARENDON and MILLER, Tps.—Number of buildings erected, 2; cost, $700. Amount expended on permanent improvements, $600. J. A. Card, Township Clerk, Plevna.

CLARKE, Tp.—Opening for canning factory. Number of buildings erected, 20; cost $25,000. Amount expended on permanent improvements, $3,899. Amount expended on sanitation, $125. John Rickaby, Township Clerk, Orono.

CLIFFORD, V.—Owns and operates acetylene gas plant, cost $3,000. Good openings for any light industry. One new building erected, cost $2,500. Amount expended on permanent improvements, $276. J. R. Aitcheson, Village Clerk, Clifford.

CLINTON, Tn.—Motor car business started. Owns and operates waterworks; cost $59,000. Good openings for industries of any character. Number of buildings erected, 2; cost, $4,000. Amount expended on permanent improvements, $8,000. D. L. Macpherson, Town Clerk, Clinton.

CLINTON, Tp.—Number of buildings erected, 12; cost $22,800. Amount expended on permanent improvements, $4,682. G. W. Tinlin, Township Clerk, Beamsville.

CLYDE, Tp.—See Dysart, etc., Tps.

COBALT, Tn.—Owns and operates waterworks, cost $110,000. Number of buildings erected, 26; cost $20,000. Amount expended on permanent improvements, $7,016. Amount expended on sanitation, $7,781. R. L. O'Gorman, Town Clerk, Cobalt.

Cobden, V.—Good openings for flour mill and brick tile yard. No new buildings erected. Amount expended on permanent improvements, $3,026. Joseph R. Warren, Village Clerk, Cobden.

Cobourg, Tn.—Canning factory started. Good openings for any kind of industries. Number of buildings erected, 46; cost $138,000. Amount expended on permanent improvements, $4,343. Amount expended on sanitation, $2,199. D. H. Minaker, Town Clerk, Cobourg.

Cochrane, Tn.—Planing mill started. Owns and operates waterworks, cost $54,000. Number of buildings erected, 215; cost $268,600. Amount expended on permanent improvements, $12,000. S. L. Bradley, Town Clerk, Cochrane.

Cockburn Island, Tp.—Saw mill started. Good openings for brick and cement works, lime, and builders' stone and wood industries. One building erected, cost $500. Amount expended on permanent improvements, $483. D. J. McLeod, Township Clerk, Cockburn Island.

Colborne, Tp.—No new buildings erected. Amount expended on permanent improvements, $2,142. R. McIlwain, Township Clerk, Nile.

Colborne, V.—Canning factory started. Automobile factory being opened. Good openings for various industries. One new building erected, cost $4,000. Amount expended on permanent improvements, $1,125. Geo. Keyes, Village Clerk, Colborne.

Colchester, N., Tp.—Cement works started. Owns and operates telephone system, cost $10,154. Good openings for brick and tile yard, excelsior factory, and cheese factory. Number of buildings erected, 15; cost $12,000. Amount expended on permanent improvements, $3,891. Amount expended on sanitation, $35. L. C. Hillis, Township Clerk, Gesto.

Colchester, S., Tp.—Good opening for canning factory. Number of buildings erected, 20; cost $20,000. Amount expended on permanent improvements, $2,489. J. H. Madill, Township Clerk, Harrow.

Coldwater, V.—Stone quarry and stone power company started. Owns and operates waterworks, cost $23,000. Openings for industries of any character. Number of buildings erected, 2; cost $25,000. J. R. Russell, Village Clerk, Coldwater.

Coleman, Tp.—Good opening for foundry and machine shop. No new buildings erected. Amount expended on permanent improvements, $47,668. Amount expended on sanitation, $145. P. J. Hart, Township Clerk, Cobalt.

Collingwood, Tn.—Owns and operates waterworks, cost $73,914; electric light plant, $47,485. Number of buildings erected, 20; cost, $68,450. Amount expended on permanent improvements, $8,000. Amount expended on sanitation, $5,000. J. H. Duncan, Town Clerk, Collingwood.

Collingwood, Tp.—Owns and operates waterworks system for fire protection in the village of Clarksburg, cost $7,000. Number of buildings erected, 11; cost, $8,000. Amount expended on permanent improvements, $5,123. E. Rorke, Township Clerk, Thornbury.

Copper Cliff, Tn.—Number of buildings erected, 12; cost $22,000. Amount expended on permanent improvements, $802. Amount expended on sanitation, $1,842. Thos. Stoddard, Town Clerk, Copper Cliff.

Cornwall, Tn.—Owns and operates waterworks, value $142,632. Openings for industries of any character. Number of buildings erected, 9; cost $34,600. Amount expended on permanent improvements, $9,235. Amount expended on sanitation, $769. George S. Jarvis, Town Clerk, Cornwall.

Cornwall, Tp.—Good openings for paper industry, hardware and cement

works. Number of buildings erected, 20; cost $21,000. Amount expended on permanent improvements, $6,000. John Mullin, Township Clerk, Cornwall Centre.

Courtright, V.—Good openings for almost any kind of industries. One building erected, cost $500. Amount expended on permanent improvements, $852. R. G. Hewart, Village Clerk, Courtright.

Cramahe, Tp.—Apple evaporator started. Good opening for canning factory. Amount expended on permanent improvements, $4,650. Amount expended on sanitation, $26. C. A. Wilson, Township Clerk, Castleton.

Creemore, V.—Owns and operates waterworks, cost $20,000. Good opening for canning factory. Number of buildings erected, 3; cost $4,000. Amount expended on permanent improvements, $500. A. H. Watson, Village Clerk, Creemore.

Crosby, N., Tp.—Number of buildings erected, 4; cost $2,000. Amount expended on permanent improvements, $541. Wm. McKnight, Township Clerk, Westport.

Crosby, S., Tp.—Number of buildings erected, 6; cost $3,000. Amount expended on permanent improvements, $2,000. J. R. Dungavel, Township Clerk, Elgin.

Crowland, Tp.—Automatic transportation industry started. Good openings for a cheese or butter factory. Number of buildings erected, 33; cost $120,000. Amount expended on permanent improvements, $1,800. Amount expended on sanitation, $937. H. L. Pratt, Township Clerk, Welland.

Crozier, Tp.—See Alberton Tp.

Culross, Tp.—Good opening for lime and brick kiln. Number of buildings erected, 3; cost $1,500. Amount expended on permanent improvements, $2,000. Amount expended on sanitation, $40. Chas. Button, Township Clerk, Teeswater.

Cumberland, Tp.—Good openings for stove foundry, flour mill, carriage factory and saw mill. Number of buildings erected, 19; cost $10,000. Amount expended on permanent improvements, $1,200. H. H. Dunning, Township Clerk, Cumberland.

Dack, Tp.—Good opening for pulp mill. Number of buildings erected, 9; cost $6,400. Amount expended on permanent improvements, $1,477. Amount expended on sanitation, $102. J. K. Dugan, Township Clerk, Charlton.

Dalhousie and Sherbrooke, N., Tp.—Good opening for any industry using hardwood; excellent water power sites on Mississippi suitable for electric power. Number of buildings erected, 8; cost $5,000. Amount expended on permanent improvements, $826. Walter Geddes, Township Clerk, Dalhousie Lake.

Dalton, Tp.—Number of buildings erected, 3; cost $2,100. Amount expended on permanent improvements, $300. Bert. Nicholson, Township Clerk, Sebright.

Darling, Tp.—Good opening for graphite mine. No new buildings erected. Amount expended on permanent improvements, $192. Amount expended on sanitation, $6. Thos. D. King, Township Clerk, Tatlock.

Darlington, Tp.—Number of buildings erected, 10; cost $10,000. Amount expended on permanent improvements, $6,000. Amount expended on sanitation, $20. H. Elliott, Township Clerk, Hampton.

Dawn, Tp.—Establishing a municipal telephone system, cost about $10,000. Number of buildings erected, 20; cost $15,000. Amount expended on permanent improvements, $3,000. J. M. Webster, Township Clerk, Rutherford.

Day and Bright Additional, Tps.—Good opening for creamery or cheese fac-

tory. Number of buildings erected, 6; cost $4,000. Amount expended on permanent improvements, $400. Chas. Cavanagh, Township Clerk, Sowerby.

Delaware, Tp.—Number of buildings erected, 5; cost $4,000. Amount expended on permanent improvements, $4,410. Amount expended on sanitation, $66. J. H. Matthews, Township Clerk, Delaware.

Delhi, V.—Openings for industries of any character. No new buildings erected. Amount expended on permanent improvements, $2,540. Roger Crysler, Village Clerk, Delhi.

Denbigh, Abinger and Ashby, Tps.—Number of buildings erected, 6; cost $1,800. Amount expended on permanent improvements, $266. Paul Stein, Township Clerk, Denbigh.

Denison, Tp.—See Drury, Denison and Graham Tps.

Derby, Tp.—Amount expended on permanent improvements, $4,333. Amount expended on sanitation, $65. Wm. Beaton, Township Clerk, Owen Sound.

Dereham, Tp.—Good opening for brick and tile yard. Amount expended on permanent improvements, $7,000, and 7,000 days' statute labour.. Amount expended on sanitation, $100. Alex. Bell, Township Clerk, Verschoyle.

Deseronto, Tn.—Canning factory and electric power and lighting started. Owns and operates waterworks, cost $35,000; pumping station, cost $28,000; gas works, cost $28,000. Good openings for condensed milk factory, furniture factory, metallic roofing, stoves and furnaces, pork packing, confectionery and biscuit factory, canvas boots, cigar factory, carriage factory, agricultural implements factory, tanneries, saw mills, and pulp and paper mills. One building erected, cost $500. Amount expended on permanent improvements, $823. Amount expended on sanitation, $878. Henry R. Bedford, Town Clerk, Deseronto.

Digby, Tp.—See Laxton, Digby and Longford Tps.

Dilke, Tp.—Good opening for box factory and brick yard. Number of buildings erected, 2; cost $2,000. Amount expended on permanent improvements, $1,279. Frank Longmore, Township Clerk, Pinewood.

Dorchester, N., Tp.—Good opening for canning factory. Amount expended on permanent improvements, $4,000. W. B. Lane, Township Clerk, Dorchester Station.

Dorchester, S., Tp.—Good openings for powdered milk, pickles, can factory, furniture factory. Number of buildings erected, ; cost, $. Amount expended on permanent improvements, $4,000. Duncan Taylor, Township Clerk, Belmont.

Douro, Tp.—Number of buildings erected, 7; cost $5,000. Amount expended on permanent improvements, $2,000. J. J. Allen, Township Clerk, Douro.

Dover, Tp.—Good opening for grist mill. Number of buildings erected, 10; cost $11,600. Amount expended on permanent improvements, $10,000. Amount expended on sanitation, $9,000. John Welsh, Township Clerk, Chatham.

Downie, Tp.—Number of buildings erected, 10; cost $16,800. Amount expended on permanent improvements, $7,500. Amount expended on sanitation, $108. P. Smith, Township Clerk, Stratford.

Draper, Tp.—Good opening for any kind of industries requiring water power. No new buildings erected. Amount expended on permanent improvements, $1,800. D. Cairns, Township Clerk, Uffington.

Drayton, V.—Flax mills started. Good opening for brick yard and pottery. Number of buildings erected, 7; cost, $7,100. Amount expended on permanent improvements, $500. Amount expended on sanitation, $50. A. C. Woodman, Village Clerk, Drayton.

Dresden, Tn.—Owns and operates electric light plant, cost $14,500; water-

works for fire protection, cost $16,000. Number of buildings erected, 5; cost $7,700. Amount expended on permanent improvements, $3,241. Amount expended on sanitation, $400. J. T. Bridgewater, Town Clerk, Dresden.

Drummond, Tp.—Number of buildings erected, 15; cost $3,000. Amount expended on permanent improvements, $755. Amount expended on sanitation, $27. E. R. Stedman, Township Clerk, Richardson.

Drury, Denison and Graham, Tps.—Owns and operates street light system, cost $226. Number of buildings erected, 5; cost $2,000. Amount expended on permanent improvements, $2,417. Amount expended on sanitation, $853. H. C. Sinclair, Township Clerk, Victoria Mines.

Dryden, Tn.—Pulp and paper mills, saw mill, brick yard and timber and power industry started. Good opening for flour mills, excelsior plant, cheap power being obtainable. Number of buldings erected, 9; cost $17,000. Amount expended on permanent improvements, $1,800. Amount expended on sanitation, $250. Chas. A. Taylor, Town Clerk, Dryden.

Dudley, Tp.—See Dysart, etc., Tps.

Dumfries, N., Tp.—Number of buildings erected, 7; cost $5,000. Amount expended on permanent improvements, $7,443. Jos. Wrigley, Township Clerk, Ayr.

Dumfries, S., Tp.—Number of buildings erected, 6; cost, $14,000. Amount expended on permanent improvements, $3,317, besides 1,750 days' statute labour. Amount expended on sanitation, $124. H. S. Man, Township Clerk, Paris.

Dummer, Tp.—Number of buildings erected, 14; cost $15,500. Amount expended on permanent improvements, $1,785. Amount expended on sanitation, $16. Richard Deen, Township Clerk, Warsaw.

Dungannon, Tp.—Marble quarry and shingle mill started. Number of buildings erected, 3; cost, $1,300. Amount expended on permanent improvements, $1,000. Amount expended on sanitation, $175. John Lumb, Township Clerk, L'Amable.

Dundalk, V.—Sash and door and planing mill started. Owns and operates electric light plant, cost $8,000. Good opening for furniture factory and foundry. Number of buildings erected, 2; cost $1,000. Amount expended on permanent improvements, $500. Amount expended on sanitation, $100. M. W. Ridley, Village Clerk, Dundalk.

Dundas, Tn.—Owns and operates waterworks, cost $67,003; electric light plant, cost $12,667. Good openings for industries of almost any character. Number of buildings erected, 25; cost $45,000. Amount expended on sanitation, $130. John S. Fry, Town Clerk, Dundas.

Dunn, Tp.—Good openings for lime and brick kilns. Number of buildings erected, 3; cost $2,000. Amount expended on permanent improvements, $150. Amount expended on sanitation, $10. David Lyons, Township Clerk, Byng.

Dunville, Tn.—Owns and operates waterworks, cost $31,000. Good sites for iron works and harbour and other shipping facilities. Number of buildings erected, 19; cost $53,500. Amount expended on permanent improvements, $3,000. J. W. Holmes, Town Clerk, Dunville.

Dunwich, Tp.—Number of buildings erected, 1; cost $1,000. Amount expended on permanent improvements $3,500. D. A. McNabb, Township Clerk, Dutton.

Durham, Tn.—Openings for industries of any character. Number of buildings erected, 10; cost $32,610. Wm. B. Vollet, Town Clerk, Durham.

Dutton, V.—Saw mill started. Good opening for canning factory, basket fac-

tory and woodenware factory. Number of buildings erected, 3; cost $4,000. Amount expended on permanent improvements, $750. Amount expended on sanitation, $40. L. D. Blue, Village Clerk, Dutton.

Dymond, Tp.—Amount expended on permanent improvements, $2,923. Amount expended on sanitation, $5. E. F. Stephenson, Township Clerk, New Liskeard.

Dysart, etc., Tps.—Owns and operates street lighting plant, cost $400. Good opening for saw mill, stave mill, shingle and lath mill, planing mill, creamery or cheese factory. Number of buildings erected, 40; cost $30,000. Amount expended on permanent improvements, $3,000. Amount expended on sanitation, $100. G. H. Potts, Township Clerk, Haliburton.

Easthope, N., Tp.—Owns and operates telephone system, cost $21,970. Number of buildings erected, 24; cost $15,000. Amount expended on permanent improvements, $2,000. J. D. Fisher, Township Clerk, Amulree.

Easthope, S., Tp.—Good opening for brick and tile yard. Number of buildings erected, 6; cost $3,000. Amount expended on permanent improvements, $1,799. V. Stock, Township Clerk, Tavistock.

Eastnor, Tp.—Good opening for brick and tile plant. Number of buildings erected, 2; cost $2,000. Amount expended on permanent improvements, $1,365. Amount expended on sanitation, $98. William Laidlaw, Township Clerk, Lion's Head.

Eastview, V.—Good openings for various industries. Number of buildings erected, 115; cost $30,000. Amount expended on permanent improvements, $2,407. H. R. Washington, Village Clerk, Cummings Bridge.

Edwardsburg, Tp.—Number of buildings erected, ; cost $15,000. Amount expended on permanent improvements, $1,700. Amount expended on sanitation, $46. M. McGuire, Township Clerk, Spencerville.

Effingham, Tp.—See Kaladar, Anglesea, and Effingham Tps.

Eganville, V.—Good openings for flour mill, sash and door factory, woollen mills and saw mills. Number of buildings erected, 30; cost $100,000. Amount to be expended on permanent improvements this spring, $6,000. Hugh Costello, Village Clerk, Eganville.

Egremont, Tp.—Good opening for shoemaker. Number of buildings erected, 3; cost $3,000. Amount expended on permanent improvements, $3,000. David Allan, Township Clerk, Holstein.

Ekfrid, Tp.—Number of buildings erected, 4; cost $9,500. Amount expended on permanent improvements, $5,057. A. P. McDougald, Township Clerk, Melbourne.

Elderslie, Tp.—Number of buildings erected, 12; cost $20,000. Amount expended on permanent improvements, $4,748. Amount expended on sanitation, $26. R. C. Pearse, Township Clerk, Paisley.

Eldon, Tp.—Number of buildings erected, 6; cost $7,000. Amount expended on permanent improvements, $4,500. B. Stacey, Township Clerk, Lorneville.

Ellice, Tp.—Good opening for harness maker. Number of buildings erected, 28; cost $21,000. Amount expended on permanent improvements, $3,309. Amount expended on sanitation, $172. Justus Kreuter, Township Clerk, Rostock.

Elma, Tp.—Good openings for sash and door factory and condensed milk factory. Number of buildings erected, 12; cost, $15,000. Amount expended on permanent improvements, $4,250. Amount expended on sanitation, $120. Geo. Lochhead, Township Clerk, Atwood.

Elmira, V.—Boot and shoe factory started. Owns and operates waterworks system, cost $35,000. Number of buildings erected, 23; cost $25,000. Amount expended on permanent improvements, $2,000. J. H. Rupple, Village Clerk, Elmira.

Elmsley, N., Tp.—Good opening for stave or cheese box factory. One new building erected, cost $500. Amount expended on permanent improvements, $340. Amount expended on sanitation, $56. R. M. Imeson, Township Clerk, Perth.

Elmsley, S., Tp.—Number of buildings erected, 4; cost, $2,000. Amount expended on permanent improvements, $164. John Rabb, Township Clerk, Lombardy.

Elora, V.—Number of buildings erected, 3; cost, $6,000. Amount expended on permanent improvements, $800. Henry Clarke, Village Clerk, Elora.
permanent improvements, $800 Henry Clarke, Village Clerk, Elora.

Elzevir and Grimsthorp, Tps.—Good water power for electric machinery for industries. Number of buildings erected, 5; cost $4,000. Amount expended on permanent improvements, $1,078. W. J. Rhodes, Township Clerk, Queensboro.

Embro, V.—Tile yard started. Good opening for brick yard, laundry, machine repair shop. No new buildings erected. Amount expended on permanent improvements, $250. E. J. Cody, Village Clerk, Embro.

Emily, Tp.—Number of buildings erected, 15; cost $11,000. Amount expended on permanent improvements, $2,361. R. J. Grandy, Township Clerk, Omemee.

Emo, Tp.—Planing mill and saw mill started. Good opening for flour mill Number of buildings erected, 6; cost $4,500. Amount expended on permanent improvements, $4,929. D. Strachan, Township Clerk, Emo.

Englehart, Tn.—Good openings for dentist, brick yard, and lumber yard. Number of buildings erected, ; cost, $3,525. Amount expended on permanent improvements, $589. Amount expended on sanitation, $326. J. H. Field, Town Clerk, Englehart.

Enniskillen, Tp.—Number of buildings erected, 6; cost, $5,500. Amount expended on permanent improvements, $7,000. Amount expended on sanitation, $14. G. V. Wyant, Township Clerk, Petrolea.

Ennismore, Tp.—Number of buildings erected, 8; cost $3,000. Amount expended on permanent improvements, $2,000. John Moloney, Township Clerk, Ennismore.

Eramosa, Tp.—Number of buildings erected, 14; cost, $18,000. Amount expended on permanent improvements, $3,337. Amount expended on sanitation, $215. W. M. Head, Township Clerk, Guelph.

Erin, Tp.—Good opening for electric railway. No new buildings erected. Amount expended on permanent improvements, $700. Peter McLaren, Township Clerk, Ospringe.

Erin, V.—Vacant woollen mill with water power available. No new buildings erected. Amount expended on permanent improvements, $1,000. Wm. Conboy, Village Clerk, Erin.

Ernesttown, Tp.—Number of buildings erected, about 6; cost, about $3,000. Amount expended on permanent improvements, $2,174. E. O. Clark, Township Clerk, Odessa.

Escott, Front, Tp.—Number of buildings erected 5; cost, $3,200. Amount expended on permanent improvements, $1,740. Amount expended on sanitation, $18. F. T. Hutchison, Township Clerk, Escott.

Esquesing, Tp.—Brick and terra cotta factory started. Number of buildings erected, ; cost $15,000. J. A. Tracy, Township Clerk, Esquesing Post Office.

Essa, Tp.—Number of buildings erected, 5; cost, $500. Amount expended on permanent improvements, $1,726. Amount expended on sanitation, $200. John Coxworth, Township Clerk, Ivy.

Essex, Tn.—Owns and operates waterworks; cost, $33,000. Number of buildings erected, 8; cost, $8,100. Amount expended on sanitation, $130. Geo. E. Wightman, Town Clerk, Essex.

Etobicoke, Tp.—Fruit packing industry and planing mill started. Good opening for factories requiring electric power. Number of buildings erected, 37; cost, $112,000. Amount expended on permanent improvements, $6,500. Amount expended on sanitation, $1,100. J. A. L. Macpherson, Township Clerk, Islington.

Euphemia, Tp.—Number of buildings erected, 2; cost, $2,200. Amount expended on permanent improvements, $2,891. D. M. Smith, Township Clerk, Cairo.

Euphrasia, Tp.—No new buildings erected. Amount expended on permanent improvements, $3,084; N. L. Curry, Township Clerk, Rocklyn.

Exeter, V.—Owns and operates waterworks; cost, $22,000. Good openings for sugar beet factory, knitting factory and oatmeal mill. Number of buildings erected, 7; cost, $9,000. T. B. Carling, Village Clerk, Exeter.

Eyre, Tp.—See Dysart, etc., Tps.

Faraday, Tp.—No new buildings erected. Amount expended on permanent improvements, $400. W. A. Davy, Township Clerk, Bancroft.

Fenelon, Tp.—Number of buildings erected, 12; cost, $12,000. Amount expended on permanent improvements, $2,200. John B. Powles, Township Clerk, Powles Corner.

Fenelon Falls, V.—Owns and operates electric light plant; cost, $75,000. Good openings for industries of any character. Number of buildings erected, 3; cost, $8,000. Amount expended on permanent improvements, $1,000. E. Fitzgerald, Village Clerk, Fenelon Falls.

Fergus, V.—Barn equipment factory started. Installing waterworks system this year at a cost of $35,000. Good openings for various industries. Number of buildings erected, 14; cost, $70,000. Amount expended on permanent improvements, $9,439. Amount expended on sanitation, $150. James Beatie, Village Clerk.

Ferris, Tp.—Openings for various industries, with good water power. Number of buildings erected, 5; cost, $1,500. Amount expended on permanent improvements, $500. S. Moreau, Township Clerk, Corbeil.

Finch, V.—No new buildings erected. Amount expended on permanent improvements, $31. J. R. Simpson, Village Clerk, Finch.

Finch, Tp.—Good opening for concrete tile and brick factory. Number of buildings erected, 6; cost, $3,000. Amount expended on permanent improvements, $4,070. D. B. Cameron, Township Clerk, Finch.

Fitzroy, Tp.—Good openings for various industries. Number of buildings erected, ; cost, $9,000. Amount expended on permanent improvements, $2,600. A. Murphy, Township Clerk, Antrim.

Flamborough, E., Tp.—Good openings for evaporators, basket factory, coal business, etc. Number of buildings erected, 8; cost, $95,000. Amount expended on permanent improvements, $5,100. George Church, Township Clerk, Carlisle.

Flamborough, W., Tp.—Number of buildings erected, 4; cost, $2,050. Amount expended on permanent improvements, $1,400. Amount expended on sanitation, $130. Ira N. Binkley, Township Clerk, Greensville.

Flos, Tp.—Good opening for flax mill, woollen mill and foundry. Number of buildings erected, 6; cost $9,000. Amount expended on permanent improvements, $1,200. C. S. Burton, Township Clerk, Elmvale.

Foley, Tp.—Sawmill started. Number of buildings erected, 4; cost, $2,500. Amount expended on permanent improvements, $1,005. Amount expended on sanitation, $30. Andrew Oastler, Township Clerk, James Bay Junction.

Forest, Tn.—Basket factory and cement blocks and tile factory started. Good openings for knitting and woollen factory, furniture and chair factory, pickle factory, and cigar factory. Number of buildings erected, 5; cost, $48,600. Amount of permanent improvements, $1,250. Amount expended on sanitation, $35. Richard Karn, Town Clerk, Forest.

Fort Erie, V.—Novelties factory started. Owns and operates waterworks, cost $55,000; electric light plant, cost $4,000. Good opening for furniture factory, tailor and jewelry stores. Number of buildings erected, 15; cost, $15,000. Amount expended on permanent improvements, $1,000. B. F. Matthews, Village Clerk, Fort Erie.

Fort Frances, Tn.—Saw and planing mill started. Owns and operates waterworks system, cost $82,620; electric light system, cost $16,637. Good opening for lumber industry. Number of buildings erected, 18; cost, $16,500. Amount expended on permanent improvements. $1,666. Amount expended on sanitation, $608. J. W. Walker, Town Clerk, Fort Frances.

Fort William, C.—Owns and operates waterworks, cost $877,433; electric light plant, cost $211,366; street railway, cost $505,000; telephone system, cost $199,000. Good openings for structural steel works, cereal products factories, vinegar factory, carpet factory, elevator factory, automobile factory, rubber factory. Number of buildings erected, 479; cost, $3,077,860. Amount expended on permanent improvements, $205,829. Amount expended on sanitation, $148,562. A. McNaughton, City Clerk, Fort William.

Fredericksburgh, N., Tp.—One new building erected, cost, $3,000. Amount expended on permanent improvements, $1,241. Amount expended on sanitation, $58. M. A. Sills, Township Clerk, Gretna.

Fredericksburgh, S., Tp.—Good opening for general blacksmith. Number of buildings erected, 13; cost, $11,300. Amount expended on permanent improvements, $512. Geo. T. Ham, Township Clerk, Conway.

Fullarton, Tp.—Number of buildings erected, ; cost, $2,000. Amount expended on permanent improvements, $2,600. E. H. Pomeroy, Township Clerk, Fullarton.

Gainsborough, Tp.—Butter factory started. Good opening for industries requiring electric power. Number of buildings erected, 16; cost, $16,200. Amount expended on permanent improvements, $1,630. Amount expended on sanitation, $89. S. Kennedy, Township Clerk, St. Anns.

Galt, Tn.—Machine screw foundry, planing mill and automobile industries started. Owns and operates waterworks system, cost $222,943; hydro-electric system, cost $100,000. Opening for industries of any character. Number of buildings erected, 200; cost, $282,334. Amount expended on permanent improvements, $25,721. Amount expended on sanitation, $15,712. Joseph McCartney, Town Clerk, Galt.

GALWAY AND CAVENDISH, Tp.—Good opening for cheese factory. Amount expended on permanent improvements, $350. Patrick Collins, Township Clerk, Mount Irwin.

GANANOQUE, Tn.—Owns and operates waterworks, cost $260,000. Good openings for industries requiring water power and shipping facilities. Number of buildings erected, 5; cost, $41,500. Amount expended on permanent improvements, $4,365. S. McCammon, Town Clerk, Gananoque.

GARAFRAXA, E., Tp.—Amount expended on permanent improvements, $2,349. Amount expended on sanitation, $66. John Preston, Township Clerk, Marsville.

GARAFRAXA, W., Tp.—Number of buildings erected, 3; cost, $7,000. Amount expended on permanent improvements, $1,000. James Campbell, Township Clerk, Belwood.

GARDEN ISLAND, V.—No new buildings erected. Amount expended on permanent improvements, $155. Thos. Lappen, Village Clerk, Garden Island.

GEORGETOWN, V.—Owns and operates waterworks system, cost $43,000. Good location for various industries. Number of buildings erected, 50; cost, $85,000. Amount expended on permanent improvements, $4,500. Amount expended on sanitation, $100. H. W. Kennedy, Village Clerk, Georgetown.

GEORGINA, Tp.—Number of buildings erected, 5; cost, $7,000. Amount expended on permanent improvements, $1,330. Donald Ego, Township Clerk, Virginia.

GLAMORGAN, Tp.—Good opening for woollen mill, with plenty of electric power. Amount expended on permanent improvements, $3,000. D. Williams, Township Clerk, Gooderham.

GLANFORD, Tp.—Number of buildings erected, 9; cost, $10,000. Amount expended on permanent improvements, $1,432. Amount expended on sanitation, $35. Daniel Reed, Township Clerk, Glanford.

GLENCOE, V.—Owns and operates electric light plant, cost $12,000. Good opening for pickle factory and cement block factory. Number of buildings erected, 4; cost, $1,900. Amount expended on permanent improvements, $391. Amount expended on sanitation, $102. George Wilson, Village Clerk, Glencoe.

GLENELG, Tp.—Sawmill started. Good openings for industries requiring water power. Number of buildings erected, 3; cost, $4,000. Amount expended on permanent improvements, $2,300. Amount expended on sanitation, $42. J. S. Black, Township Clerk, Pomona.

GLOUCESTER, Tp.—Cheese factory started and extension to brick factory. The village of Rickcliff owns and operates waterworks system, cost $5,000. Good opening for brick factory. Amount expended on permanent improvements, $3,989. H. B. Billings, Township Clerk, Billings Bridge.

GODERICH, Tn.—Sawmill and two grain elevators started. Owns and operates waterworks and electric light plant; cost $131,674. Good openings for industries of any character. Number of buildings erected, 25; cost, $49,300. Amount expended on permanent improvements, $4,304. Amount expended on sanitation, $9,983. L. L. Knox, Town Clerk, Goderich.

GODERICH, Tp.—Owns and operates municipal telephone, cost $11,000. Number of buildings erected, 10; cost, $10,300. Amount expended on permanent improvements, $2,200. N. W. Trewartha, Township Clerk, Holmesville.

GORDON, Tp.—Good opening for cheese and canning factories. Number of buildings erected, 5; cost $3,700. Amount expended on permanent improvements, $1,800. John Gibson, Township Clerk, Foxey.

Gore Bay, Tn.—Good opening for a sawmill. Number of buildings erected, 2; cost, $5,000. Amount expended on permanent improvements, $1,500. John W. Kinney, Town Clerk, Gore Bay.

Gosfield, N., Tp.—Owns and operates telephone system, cost $15,125. Good opening for canning factory and tobacco factory. Number of buildings erected, 10; cost, $10,000. Amount expended on permanent improvements, $2,172. Amount expended on sanitation, $25. Walter H. Noble, Township Clerk, Cottam.

Gosfield, S., Tp.—Opening for brick and tile factory. Number of buildings erected, 32; cost, $15,000. Amount expended on permanent improvements, $5,163. G. W. Coatsworth, Township Clerk, Kingsville.

Goulburn, Tp.—Number of buildings erected, 8; cost, $4,500. Amount expended on permanent improvements, $5,108. Amount expended on sanitation, $28. J. A. Cummings, Township Clerk, Hazeldean.

Gower, N., Tp.—Good openings for carriage factory, sash and door factory, cement block and tile factory, and a railroad. Number of buildings erected, 3; cost, $9,000. Amount expended on permanent improvements, $2,000. Amount expended on sanitation, $106. J. E. Craig, Township Clerk, North Gower.

Gower, S., Tp.—No new buildings erected. Amount expended on permanent improvements, $546. Amount expended on sanitation, $43. Elijah Pelton, Township Clerk, South Gower.

Graham, Tp.—See Drury, Denison and Graham, Tps.

Grand Valley, V.—Good openings for industries of any character. Number of buildings erected, 4; cost, $20,000. Amount expended on permanent improvements, $1,700. Amount expended on sanitation, $20. J. A. Richardson, Village Clerk, Grand Valley.

Grantham, Tp.—Good opening for canning factory. Number of buildings erected, 20; cost, $50,000. Amount expended on permanent improvements, $2,950. L. S. Bessey, Township Clerk, St. Catharines.

Grattan, Tp.—Number of buildings erected, ; cost, $4,500. Amount expended on permanent improvements, $716. John George, Township Clerk, Egansville.

Gravenhurst, Tn.—Owns and operates waterworks, cost $30,000; electric light and power plant, cost $95,000. Good opening for industries of any character. Number of buildings erected, 3; cost, $1,800. Amount expended on permanent improvements, $3,300. W. H. Cross, Town Clerk, Gravenhurst.

Greenock, Tp.—Amount expended on permanent improvements, $3,606. Amount expended on sanitation, $83. Thos. H. Purdy, Township Clerk, Narva.

Grey, Tp.—Good opening for cement and clay tile factory and fruit growing. Number of buildings erected, 5; cost, $6,000. Amount expended on permanent improvements, $2,730. A. H. Macdonald, Township Clerk, Ethel.

Griffith and Matawachan, Tps.—No new buildings erected. Amount expended on permanent improvements, $213 ($200 of which was expended by the Provincial Government). E. Godin, Township Clerk, Griffith.

Grimsby, V.—Canning industry and electric appliances started. Owns and operates waterworks; cost $60,000. Good opening for various industries. Number of buildings erected, $30; cost, $120,000. Amount expended on permanent improvements, $6,000. Amount expended on sanitation, $450. Jas. Brodie, Village Clerk, Grimsby.

Grimsby, N., Tp.—Number of buildings erected, 10; cost, $20,000. Amount expended on permanent improvements, $5,237. Amount expended on sanitation, $100. Thos. W. Allan, Township Clerk, Winona.

Grimsby, S., Tp.—Number of buildings erected, 5; cost, $4,800. Amount expended on permanent improvements, $800. F. W. Roberts, Township Clerk, Smithville.

Guelph, C.—Planing mill, auto. tires, gates, axles and electric conduits industries started. Owns and operates waterworks, cost $341,048; gas and electric light and power plant, cost $421,044; street railway, cost $150,699. Good opening for agricultural implement factory, ready-made clothing factory, furniture factory, hardware factory, machine shops, woodenware industries, etc. Number of buildings erected, 106; cost, $513,690. Amount expended on permanent improvements, $31,250. Amount expended on sanitation, $19,116. T. J. Moore, City Clerk, Guelph.

Guelph, Tp.—Amount expended on permanent improvements, $3,954. J. Laidlaw, Township Clerk, Guelph.

Guilford, Tp.—See Dysart, etc., Tp.

Gwillimbury, E., Tp.—Number of buildings erected, 7; cost, $5,000. Amount expended on permanent improvements, $3,300. A. R. Mackenzie, Township Clerk, Queensville.

Gwillimbury, N., Tp.—Amount expended on permanent improvements, $2,377. Henry Sennett, Township Clerk, Bellhaven.

Gwillimbury, W., Tp.—Amount expended on permanent improvements, $1,150. E. J. Evans, Township Clerk, Bradford.

Hagar, Tp.—Sawmill started. Good opening for cheese factory, butcher and baker business, also cobbler. Number of buildings erected, 5; cost, $1,060. Amount expended on permanent improvements, $74. Mrs. T. A. Millichamp, Township Clerk, Markstay.

Hagarty and Richards, Tps.—Good opening for flour and woollen mill. Amount expended on permanent improvements, $550. M. B. Grace, Township Clerk, Killaloe.

Hagarman, Tp.—Number of buildings erected, 6; cost, $2,500. Amount expended on permanent improvements, $550. F. W. McFie, Township Clerk, Dunchurch.

Hagersville, V.—Good openings for various industries. Number of buildings erected, 8; cost, $13,000. Amount expended on permanent improvements, $2,000. Amount expended on sanitation, $300. J. F. Scott, Village Clerk, Hagersville.

Haileybury, Tn.—Owns and operates waterworks; cost, $101,095. Good opening for wood working, milling or foundry industries. Number of buildings erected, 30; cost, $150,000. Amount expended on permanent improvements, $4,357. Amount expended on sanitation, $27,914. T. H. Connor, Town Clerk, Haileybury.

Haldimand, Tp.—Canning factory started. Number of buildings erected, ; cost, $40,000. Amount expended on permanent improvements, $4,800. Amount expended on sanitation, $74. Reuben Lawless, Township Clerk, Grafton.

Hallam, Tp.—Good opening for cheese factory. One new building erected, cost, $500. Amount expended on permanent improvements, $600. J. H. Toland, Township Clerk, Webbwood.

Hallowell, Tp.—Number of buildings erected, 3; cost, $3,100. Amount expended on permanent improvements, $931. E. B. Yarwood, Township Clerk, Picton.

Hamilton, C.—Covered cables, chemicals, automobiles, gas mantles, knit

goods, road making machinery, canned goods, insulated wire industries started. Good openings for industries requiring iron bar, lumber, etc. Owns and operates waterworks, cost $2,700,000; hydro-electric lighting system, cost $60,000 up to April 1st, 1912. Number of buildings erected, 1,887; cost, $4,173,105. Amount expended on permanent improvements, $52,800. Amount expended on sanitation, $255,000. S. H. Kent, City Clerk, Hamilton.

HAMILTON, Tp.—Number of buildings erected, ; cost, $10,000. Amount expended on permanent improvements, $4,049. Amount expended on sanitation, $88. J. D. Stewart, Township Clerk, Cobourg.

HANMER, Tp.—Butter and cheese factory started. Number of buildings erected, 7; cost, $8,300. Amount expended on permanent improvements, $700. Nap. Lapage, Township Clerk, Brunetville.

HANOVER, Tn.—Furniture factory and parlour frames and other such furniture factory started. Owns and operates waterworks system, cost $31,000. Good openings for furniture factory, foundry, boot and shoe factory, sash and door factory. Number of buildings erected, 49; cost, $78,000. Amount expended on sanitation, $47. John Taylor, Town Clerk, Hanover.

HARBURN, Tp.—See Dysart, etc., Tps.

HARCOURT, Tp.—See Dysart, etc., Tps.

HARLEY, Tp.—Number of buildings erected, 6; cost, $1,200. Amount expended on permanent improvements, $2,333. Edgar Cragg, Township Clerk. Hanbury.

HARRIS, Tp.—Number of buildings erected, 10; cost, $850. Amount expended on permanent improvements, $1,427. Fred Wilson, Township Clerk, New Liskeard.

HARRISTON, Tn.—Casket factory started. Owns and operates waterworks system, cost $35,000. Openings for industries of any character. Number of buildings erected, 4; cost, $14,000. Amount expended on permanent improvements, $600. A. J. Stewart, Town Clerk, Harriston.

HARROW, Tp.—See Salter, May and Harrow Tps.

HARVEY, Tp.—Owns and operates telephone system; cost $1,500. Good openings for industries requiring wood and stone. Number of buildings erected, 3; cost, $1,000. Amount expended on permanent improvements, $300. David Weir, Township Clerk, Lakehurst.

HARWICH, Tp.—Pork packing plant started. Number of buildings erected, 6; cost, $65,000. Amount expended on permanent improvements, $11,600. Amount expended on sanitation, 104. Geo. W. Riseborough, Township Clerk, Blenheim.

HASTINGS, V.—Good openings for any kind of industries requiring water power. Number of buildings erected, 4; cost, $1,200. Amount expended on permanent improvements, $6,000. A. Wilson, Village Clerk, Hastings.

HAVELOCK, Tp.—See Dysart, etc., Tps.

HAVELOCK, V.—Good opening for canning factory, green house and market garden, grist or choping mill and wood working industries of any kind. Number of buildings erected, 4; cost, $7,200. Amount expended on permanent improvements, $9,000. Amount expended on sanitation, $60. J. W. Bryans, Village Clerk, Havelock.

HAWKESBURY, Tn.—Owns and operates waterworks system; cost $110,000. Openings for machine shop, furniture factory and carriage factory. Number of buildings erected 5; cost $10,000. Amount expended on permanent improve-

ments $903. Amount expended on sanitation $1,150. Leo. Doyle, Town Clerk, Hawkesbury.

Hawkesbury, E., Tp.—Number of buildings erected 10; cost $12,000. Amount expended on permanent improvements $2,000. Nap. Labrosse, Township Clerk, St. Eugene.

Hawkesbury, W., Tp.—Brick yard started. Good opening for lime kiln. Number of buildings erected 15; cost $15,000. Amount expended on permanent improvements $2,000. Amount expended on sanitation $100. W. I. Dunning, Township Clerk, Vankleek Hill.

Hay, Tp.—Good opening for cement and tile factory. No new buildings erected. Amount expended on permanent improvements, $5,565. Frd. Hess, Township Clerk, Zurich.

Head, Maria and Clara, Tps.—Openings for any kind of industry. Number of buildings erected 4; cost $1,000. Amount expended on permanent improvements $600. J. H. Dunlop, Township Clerk, Mackay's Station.

Hensall, V.—Good opening for canning factory and machine shop. Number of buildings erected 3; cost $10,000. Amount expended on permanent improvements $3,000. J. L. Scott, Village Clerk, Hensall.

Hepworth, V.—Openings for furniture factory, chair factory, cheese factory, and any woodenware factory. No new buildings erected. Amount expended on permanent improvements $246. W. R. White, Village Clerk, Hepworth.

Hespeler, Tn.—Stove and furnace foundry started. Owns and operates electric ligth plant; cost $28,000. Number of buildings erected 20; cost $30,000. Amount expended on permanent improvements $5,000. Winfield Brewster, Town Clerk, Hespeler.

Hilliard, Tp.—Number of buildings erected 25; cost $1,505. Amount expended on permanent improvements $2,472. Charles Wood, Township Clerk, Hilliardton.

Hillier, Tp.—Good openings for shoemaker and dressmaker. Number of buildings erected ; cost $3,000. Amount expended on permanent improvements $500. Stephen Nease, Township Clerk, Hillier.

Hilton, Tp.—Number of buildings erected 3; cost $1,000. Amount expended on permanent improvements $1,173. W. E. Whybourne, Township Clerk, Marksville.

Himsworth, N., Tp.—Good opening for planing mill, tannery, cheese and butter factory, heading factory, brick yard; water and electric power available. Number of buildings erected 4; cost $3,000. Amount expended on permanent improvements $1,330. John R. Moon, Township Clerk, Callander.

Himsworth, S., Tp.—Good opening for sash and door factory or furniture factory. Amount expended on permanent improvements $2,666. Robert Ferguson, Township Clerk, Powassan.

Hinchinbrooke, Tp.—Good opening for boot and shoe maker. Number of buildings erected 10; cost $5,000. Amount expended on permanent improvements $825. Geo. A. Smith, Township Clerk, Parham.

Holland Landing, V.—Openings for any kind of manufacturing. No new buildings erected. Amount expended on permanent improvements $300. F. J. Sheppard, Village Clerk, Holland Landing.

Hope, Tp.—Number of buildings erected 12; cost $15,700. Amount expended on permanent improvements $2,900. Thomas Roberts, Township Clerk, Welcome.

Horton, Tp.—Amount expended on permanent improvements $1,500. Geo. Eady, Township Clerk, Renfrew.

Houghton, Tp.—Creamery started. Good opening for glass factory, with right kind of sand. Number of buildings erected 2; cost $1,750. Amount expended on permanent improvements $1,396. W. V. Stevenson, Township Clerk, Houghton.

Howard, Tp.—Amount expended on permanent improvements $4,000. Geo. McDonald, Township Clerk, Ridgetown.

Howe Island, Tp.—Number of buildings erected 4; cost $800. Amount expended on permanent improvements $25. James Teavis, Township Clerk, Howe Island.

Howick, Tp.—Amount expended on permanent improvements $7,840. Amount expended on sanitation, $85. Miss L. Walker, Township Clerk, Gorrie.

Howland, Tp.—Good opening for sash and door factory. Amount expended on permanent improvements $1,450. F. G. R. Bradbury, Township Clerk, Sheguindah.

Hudson, Tp.—Saw mill started. Good opening for blacksmith. Number of buildings erected 6; cost $3,000. Amount expended on permanent improvements $2,200. E. Sackrider, Township Clerk, New Liskeard.

Hullett, Tp.—Good opening for butter and cheese factory. Number of buildings erected 7; cost $5,000. Amount expended on permanent improvements, $6,000, exclusive of 3,000 days' statute labour. James Campbell, Township Clerk, Londesboro.

Humberstone, Tp.—Good openings for any industries on Welland Canal, with electric power, natural gas, etc. Number of buildings erected 15; cost $20,000. Amount expended on permanent improvements $6,145. Amount expended on sanitation $42. A. E. Near, Township Clerk, Gas Line.

Humphrey, Tp.—No new buildings erected. Amount expended on permanent improvements $600. A. A. Young, Township Clerk, Rosseau.

Hungerford, Tp.—Marble quarry started. Number of buildings erected 15; cost $30,000. Amount expended on permanent improvements $900. George H. Stokes, Township Clerk, Tweed.

Huntingdon, Tp.—Good opening for creamery or condensed milk factory. Number of buildings erected 6; cost $8,000. Amount expended on permanent improvements $2,500. D. T. Fleming, Township Clerk, Ivanhoe.

Huntley, Tp.—Good opening for flour mill. Amount expended on permanent improvements $4,655. Jas. H. Wilson, Township Clerk, Carp.

Huntsville, Tn.—Owns and operates waterworks and electric light system; cost about $40,000. No new buildings erected. Amount expended on permanent improvements $2,000. T. M. Cullon, Town Clerk, Huntsville.

Huron, Tp.—Good opening for evaporator. Number of buildings erected 7; cost $10,000. Amount expended on sanitation $35. Angus Martyn, Township Clerk, Ripley.

Ignace, Tp.—Stone quarry started. Number of buildings erected, 7: cost $14,000. Amount expended on permanent improvements $400. W. Earles, Township Clerk, Ignace.

Ingersoll, Tn.—Fertilizer and screw factory started. Owns and operates waterworks, cost $125,000; electric light plant, cost $80,000. Good openings for various industries. Number of buildings erected 15; cost $60,000. Amount expended on permanent improvements $6,000. W. R. Smith, Town Clerk, Ingersoll.

Innisfil, Tp.—Number of buildings erected 6; cost $10,000. Amount ex-

pended on permanent improvements $2,353. Amount expended on sanitation $111. R. J. Hill, Township Clerk, Thornton.

Iroquois, V.—Motor boat factory started. Owns and operates waterworks and electric light system; cost $40,000. No new buildings erected. Amount expended on permanent improvements $520. Jas. Flanagan, Village Clerk, Iroquois.

Jaffray and Melick, Tps.—No new buildings erected. Amount expended on permanent improvements $800. C. W. Belyea, Township Clerk, Kenora.

James, Tp.—Number of buildings erected 5; cost $6,000. Amount expended on permanent improvements $1,065. Amount expended on sanitation $200. H. E. McKee, Township Clerk, Elk Lake.

Jarvis, V.—Pickle factory and poultry and eggs industry started. Good opening for canning factory, tinsmith, painter and paper hanger. Number of buildings erected 6; cost $10,500. Amount expended on permanent improvements $900. C. E. Bourne, Village Clerk, Jarvis.

Jocelyn, Tp.—Good opening for cheese or butter factory. No new buildings erected. Amount expended on permanent improvements $1,839. J. G. Reesor, Township Clerk, Carterton.

Johnson, Tp.—Good opening for flour mill, woodworking factory or dairy industry. No new buildings erected. Amount expended on permanent improvements $1,674. W. H. Butterworth, Township Clerk, Debarats.

Joly, Tp.—Good opening for woodworking industry. No new buildings erected. Amount expended on permanent improvements $900. Geo. Harkness, Township Clerk, Sundridge.

Kaladar, Anglesea and Effingham, Tps.—Good opening for mining industry. Number of buildings erected 3; cost $2,500. Amount expended on permanent improvements $579. Amount expended on sanitation $64. M. Lessard, Township Clerk, Flinton.

Kearney, Tn.—Lath and shingle factory started. Owns and operates waterworks for fire protection; cost $700. Good opening for chemical works, tannery, furniture factory, stave and barrel factory, good power available. Number of buildings erected 4; cost $23,000. Amount expended on permanent improvements $250. Amount expended on sanitation $50. J. J. Brosman, Township Clerk, Kearney.

Keewatin, Tn.—Good openings for pulp and paper mill, flour mill, furniture factory, butter box and tub factory. Number of buildings erected 2; cost $2,000. Amount expended on permanent improvements $2,130. W. J. Craig, Town Clerk, Keewatin.

Kemptville, V.—Good opening for any manufacturing plant. No new buildings erected. Amount expended on permanent improvements $1,300. S. H. Guest, Village Clerk, Kemptville.

Kennebec, Tp.—Good opening for flour mill. Amount expended on permanent improvements $300. D. A. Osborne, Township Clerk, Arden.

Kenora, Tn.—Owns and operates waterworks, cost $212,872; hydro-electric power, cost $507,637; electric distribution system, cost $43,159; telephone system, cost $17,453. Good openings for pulp and paper mills, flour mills, or any industry requiring wood as raw material. Number of buildings erected 3; cost $10,000. Amount expended on permanent improvements $4,879. Amount expended an sanitation $1,401. M. McColloch, Town Clerk, Kenora.

Keppel, Tp.—Good openings for woodworking industries and employers of female labour. Number of buildings erected 10; cost $16,000. Amount expended on permanent improvements $500. Geo. Atkey, Township Clerk, Wiarton.

Kerns, Tp.—Amount expended on permanent improvements $1,971. H. M. Ship, Township Clerk, Milberta.

Killaloe Station, V.—Good opening for pulp and flour mills. Amount expended on permanent improvements $200. Amount expended on sanitation $80. P. J. Harrington, Village Clerk, Killaloe Station.

Kincardine, Tn.—Owns and operates waterworks, cost $47,107; electric light plant, cost $21,196. Good openings for industries of any character. Number of buildings erected 3; cost $2,500. Amount expended on permanent improvements $3,649. J. H. Scougall, Town Clerk, Kincardine.

Kincardine, Tp.—Butter factory started. R. B. Campbell, Township Clerk, Armow.

King, Tp.—Owns and operates lighting plant; cost $1,800. Good opening for cement works. Number of buildings erected 32; cost $27,200. Amount expended on permanent improvements $7,200. Amount expended on sanitation $420. J. L. Jenkins, Township Clerk, King.

Kingston, C.—Paper box factory and brick yard started. Owns and operates waterworks, cost $322,287; electric light plant, cost $383,568. Good openings for industries of any character. Number of buildings erected 52; cost $151,230. Amount expended on permanent improvements $12,059. Amount expended on sanitation $1,265. W. W. Sands, City Clerk, Kingston.

Kingston, Tp.—Good opening for canning factory. Number of buildings erected ; cost $12,000. Amount expended on permanent improvements $2,000. Chas. F. Adair, Township Clerk, Cataraqui.

Kingsville, Tn.—Tobacco factory started. Owns and operates waterworks; cost $35,000. Own natural gas lines through town, leased at $1,000 a year. Good openings for industries of any character. Number of buildings erected 4; cost $13,000. Amount expended on permanent improvements $4,500. Geo. Peares, Town Clerk, Kingsville.

Kinloss, Tp.—Number of buildings erected 5; cost $10,200. Amount expended on permanent improvements $1,863. Thomas Murray, Township Clerk, Langside.

Kitley, Tp.—Good opening for canning factory. Number of buildings erected 4; cost $5,000. Amount expended on permanent improvements $2,000. J. M. Edgar, Township Clerk, Toledo.

Korah and Parke, Tps.—Good openings for any industries using hard or soft woods. Number of buildings erected 11; cost $3,150. Amount expended on permanent improvements $4,200. R. M. Moore, Township Clerk, Sault Ste. Marie.

Lake, Tp.—See Marmora and Lake Tps.

Lakefield, V.—Good openings for woodworking. Number of buildings erected 2; cost $4,000. Amount expended on permanent improvements $3,500. W. Sherin, Village Clerk, Lakefield.

Lanark, Tp.—Number of buildings erected 5; cost $6,000. Amount expended on permanent improvement $1,000. Arch. Rankin, Township Clerk, Middleville.

Lanark, V.—Good opening for electric light plant. No new buildings erected. Amount expended on permanent improvements $6,600. R. Beatty, Village Clerk, Lanark.

Lancaster, Tp.—Number of buildings erected 16; cost $12,000. Amount expended on permanent improvements $2,859. Arch. J. McDonald, Township Clerk, North Lancaster.

Lancaster, V.—No new buildings erected. Amount expended on permanent improvements $1,000. Amount expended on sanitation $10. J. McL. Sutherland, Village Clerk, Lancaster.

Lansdowne Front, Tp.—See Leeds and Lansdowne Front, Tps.

Latchford, Tn.—Ore refining industry started. Good opening for pulp mill. No new buildings erected. Amount expended on permanent improvements $109. S. A. Starling, Town Clerk, Latchford.

Lavallee, Tp.—Good opening for grist mill. Number of buildings erected 3; cost $3,285. Amount expended on permanent improvements $7,243. Arthur Cooke, Township Clerk, Devlin.

Lavant, Tp.—Good opening for mining industry. Amount expended on permanent improvements $204. Wm. Browning, Township Clerk, Lavant Station.

Laxton, Digby and Longford, Tps.—Good opening for cheese or butter factory. Number of buildings erected 10; cost $4,000. Amount expended on permanent improvements $1,200. E. F. LeCraw, Township Clerk, Norland.

Leamington, Tn.—Owns and operates waterworks, cost $26,000; gas plant, valued at $25,000. Good opening for various industries. Number of buildings erected 18; cost $23,000. Amount expended on permanent improvements $5,565. Amount expended on sanitation $100. R. M. Selkirk, Town Clerk, Leamington.

Leeds and Lansdowne Front, Tps.—Motor boat industry started. Good openings for printing office, brick and tile yard, carriage and wagon factory, etc. Number of buildings erected 16; cost $30,000. Amount expended on permanent improvements $7,209. Amount expended on sanitation $79. J. D. W. Darling, Township Clerk, Lansdowne.

Leeds and Lansdowne Rear, Tps.—Electric light plant started. Number of buildings erected 8; cost $8,000. Amount expended on permanent improvements $1,700. R. J. Green, Township Clerk, Oak Leaf.

Limerick, Tp.—Number of buildings erected 2; cost $350. Amount expended on permanent improvements $798. J. W. Ham, Township Clerk, St. Ola.

Lindsay, Tn.—Cement and mushroom industries started. Owns and operates waterworks, cost $125,000. Good opening for manufacturing of any kind. Number of buildings erected 22; cost $75,000. Amount expended on permanent improvements $3,500. Amount expended on sanitation $2,000. D. Ray, Town Clerk, Lindsay.

Lindsay, Tp.—Good opening for woodenware industries. Number of buildings erected 4; cost $1,400. Amount expended on permanent improvements $1,200. Amount expended on sanitation $30. Henry Ribbel, Township Clerk, Brickman's Corners.

Listowel, Tn.—Tile works started. Owns and operates waterworks, cost $30,000; electric light plant, cost $16,000. One new building erected; cost $700. Amount expended on permanent improvements, $1,522. Amount expended on sanitation $581. Wm. Bright, Town Clerk, Listowel.

Little Current, Tn.—Good opening for box factory, sash and door factory. Number of buildings erected 15; cost $40,000. D. McGilvery, Town Clerk, Little Current.

Lobo, Tp.—Number of buildings erected 12; cost $12,500. Amount expended on permanent improvements $7,160. E. R. Barclay, Township Clerk, Poplar Hill.

Lochiel, Tp.—Amount expended on permanent improvements $3,000. V. G. Chisholm, Township Clerk, Lochiel.

Logan, Tp.—Number of buildings erected 5; cost $12,000. Amount expended on permanent improvements $5,385. Amount expended on sanitation $4,713. Francis Jacob, Township Clerk, Brodhagan.

London, C.—Knitting, hosiery and cigar factories started. Owns and operates waterworks, cost $1,123,404; hydro-electric, cost $1,000,000. Good openings for iron and steel industry, textile factory, carpet factory, brass goods, woodworking and porcelain factories. Number of buildings erected 1,039; cost $1,036,880. Amount expended on permanent improvements $1,123,434. Amount expended on sanitation $517,638. S. Baker, City Clerk, London.

London, Tp.—Dressed casing industry started. Good opening for various industries. Number of buildings erected 100; cost $100,000. Amount expended on permanent improvements $28,508. Amount expended on sanitation $478. Mary Grant, Township Clerk, 110 Dundas Street, London.

Longueuil, Tp.—Number of buildings erected 7; cost $2,000. Amount expended on permanent improvements $1,000. Ed. Carriere, Township Clerk, Ritchance.

L'Orignal, V.—Good openings for industries requiring hard or soft wood. Number of buildings erected 15; cost $10,000. Amount expended on permanent improvements $3,000. Colin G. O'Brian, Village Clerk, L'Orignal.

Loughborough, Tp.—Opening for brick yard. Amount expended on permanent improvements $2,312. F. M. Lawson, Township Clerk, Sydenham.

Louth, Tp.—Cold storage plant, planing mill and canning factory started. Good opening for cheese factory, creamery and basket factory. M. A. Ball, Township Clerk, Jordan.

Lucan, V.—Owns and operates electric light plant; cost $5,000. Good openings for various industries. Number of buildings erected cost $5,000. Geo. A. Stanley, Village Clerk, Lucan.

Lucknow, V.—Owns and operates waterworks for fire protection; cost $10,000. Good openings for clothing factory, knitting factory, canning factory and furniture factory. One new building erected: cost $200. Amount expended on permanent improvements $33. Joseph Agnew, Village Clerk, Lucknow.

Luther, E., Tp.—Good openings for various industries. Number of buildings erected 6; cost $6,000. Amount expended on permanent improvements $2,492. Amount expended on sanitation $29. J. H. Richardson, Township Clerk, Grand Valley.

Luther, W., Tp.—Number of buildings erected 3; cost $3,000. Amount expended on permanent improvements $1,871. Amount expended on sanitation $58. W. W. Duncan, Township Clerk, Conn.

Lutterworth, Tp.—Number of buildings erected 6; cost $2,000. Amount expended on permanent improvements $500. John H. Hulbig, Township Clerk, Minden.

Lynedoch, Tp.—See Brudenell and Lynedoch Tps.

McClure, Tp.—See Bangor, Wicklow and McClure Tps.

McDougall, Tp.—Good opening for woodenware industries. Number of buildings erected 2; cost $1,000. Amount expended on permanent improvements $909. Amount expended on sanitation $40. W. H. Gold, Township Clerk, Parry Sound.

McGillivray, Tp.—Number of buildings erected 3; cost $4,200. Amount expended on permanent improvements $3,890. J. D. Drummond, Township Clerk. Brinsley.

McIrvine, Tp.—Good openings for saw mill, woodenware factory, paper mill, flour mill. No new buildings erected. Amount expended on permanent improvements $360. Frank J. Strain, Township Clerk, Fort Frances.

McKellar, Tp.—Good opening for woollen mill. Number of buildings erected 3; cost $1,200. Amount expended on permanent improvements $311. Amount expended on sanitation $2. John Fletcher, Township Clerk, McKellar.

McKillop, Tp.—Number of buildings erected 5; cost $6,500. Amount expended on permanent improvements $3,405. M. Murdie, Township Clerk, Winthrop.

McKim, Tp.—Good opening for butter factory. Number of buildings erected 6; cost $3,000. Amount expended on permanent improvements $1,500. J. R. Vincent, Township Clerk, Box 322, Sudbury.

McLean and Ridout, Tps.—Good opening for saw mill. Number of buildings erected 6; cost $1,500. Amount expended on permanent improvements $120. W. H. Brown, Township Clerk, Baysville.

McMurrich, Tp.—Good opening for veneering factory. Number of buildings erected 4; cost $1,275. Amount expended on permanent improvements $700. D. C. McFarlane, Township Clerk, Sprucedale.

McNab, Tp.—Number of buildings erected 7; cost $6,000. Amount expended on permanent improvements $1,000. John McGregor, Township Clerk, Renfrew.

Macaulay, Tp.—One new building erected; cost $30. Alexander Barron, Township Clerk, Bracebridge.

Macdonald, Meredith and Aberdeen, Tps.—Saw mill and rural telephone started. Good opening for grist mill. Number of buildings erected 7; cost $5,000. Amount expended on permanent improvements $1,950. Amount expended on sanitation $60. W. L. Cherry, Township Clerk, Sylvan Valley.

Machar, Tp.—Number of buildings erected 2; cost $1,000. Amount expended on permanent improvements $300. John E. Smyth, Township Clerk, Midford P.O.

Machin, Tp.—Good opening for pulp and paper mill, saw mill and grist mill. Number of buildings erected 9; cost $2,520. Amount expended on permanent improvements $1,200. D. G. Nicholas, Township Clerk, Eagle River.

Madoc, Tp.—Number of buildings erected 20; cost $25,000. Amount expended on permanent improvements $1,200. Amount expended on sanitation $200. Wm. F. Allen, Township Clerk, Cooper.

Madoc, V.—Owns and operates electric light plant; cost $15,000. Good opening for canning factory, foundry, condensed milk factory, pork packing, saw mill, furniture factory and talc industries. Number of buildings erected 4; cost $6,000. Amount expended on permanent improvements $1,610. Amount expended on sanitation $70. W. J. Hill, Village Clerk, Madoc.

Maidstone, Tp.—Owns and operates telephone system, cost about $12,105. Good opening for brick and tile yard. Number of buildings erected 20; cost $17,000. Amount expended on permanent improvement $8,682. W. R. Phillips, Township Clerk, Maidstone.

Malahide, Tp.—Good opening for flour mill. Number of buildings erected 11; cost $8,000. Amount expended on permanent improvements $6,338. Amount expended on sanitation $200. M. E. Lyon, Township Clerk, Aylmer.

Malden, Tp.—Number of buildings erected 13; cost $2,100. E. H. Bratt, Township Clerk, Malden Centre.

MANVERS, Tp.—Number of buildings erected 7; cost $4,300. Amount expended on permanent improvements $2,153. Amount expended on sanitation $94. J. J. Preston, Township Clerk, Bethany.

MARA, Tp.—Good opening for stave and planing mill. No new buildings erected. Amount expended on permanent improvements $5,000. W. R. McPhee, Township Clerk, Brechin.

MARCH, Tp.—Number of buildings erected 2; cost $2,000. Amount expended on permanent improvements $2,000. Thomas Richardson, Township Clerk, South March.

MARIA, Tp.—See Head, Maria and Clara Tps.

MARIPOSA, Tp.—Number of buildings erected 8; cost $17,000. Amount expended on permanent improvement $6,960 in cash and 5,300 days of statute labour. Amount expended on sanitation $143. J. B. Weldon, Township Clerk, Oakwood.

MARKDALE, V.—Owns and operates waterworks; cost $30,000. Good opening for wagon and carriage factory. Number of buildings erected, ; cost $10,000. Amount expended on permanent improvement $365. W. J. Shortell, Village Clerk, Markdale.

MARKHAM, Tp.—Amount expended on permanent improvements, $6,907. C. H. Stiver, Township Clerk, Unionville.

MARKHAM, V.—Owns and operates waterworks and electric light plant; cost about $15,000. Good opening for foundry and machine shop. Number of buildings erected 2; cost $5,000. Amount expended on permanent improvements $400. M. White, Village Clerk, Markham.

MARLBOROUGH, Tp.—Number of buildings erected 2; cost $1,200. Amount expended on permanent improvements $403. Edward Mills, Township Clerk, Malakoff.

MARAMORA AND LAKE, Tps.—Good opening for mining industry. Number of buildings erected 6; cost $3,000. Amount expended on permanent improvements $1,500. T. E. Laycock, Township Clerk, Deloro.

MARMORA, V.—Owns and operates electric light plant; cost $5,000. Good opening for wood working industries. Number of buildings erected 8; cost $5,000. Amount expended on permanent improvements $500. H. W. Sabine, Village Clerk, Marmora.

MARTLAND, Tp.—Good opening for cheese or butter factory. Number of buildings erected 6; cost $2,400. Amount expended on permanent improvements $1,300. Joseph Guerin, Township Clerk, Noelville.

MARYBOROUGH, Tp.—Good opening for furniture factory. One new building erected; cost . Amount expended on permanent improvements $3,642. Amount expended on sanitation, $46. W. W. Scott, Township Clerk, Moorefield.

MARYSBURGH, N., Tp.—Good opening for canning factory. Number of buildings erected 9; cost $5,400. Amount expended on permanent improvements $800. Levi Williams, Township Clerk, Picton.

MARYSBURGH, S., Tp.—Good opening for canning factory. Number of buildings erected 15; cost $10,000. Amount expended on permanent improvements $3,000. H. F. Grimmon, Township Clerk, Port Milford.

MASSEY, Tn.—Owns and operates waterworks; cost $22,670. Amount expended on permanent improvements $37. D. W. Cantlon, Town Clerk, Massey.

MATAWATCHAN, Tp.—See Griffith and Matawatchan Tps.

MATCHEDASH, Tp.—Good opening for blacksmith shop. One new building erected; cost $4,000. Amount expended on permanent improvements $600. E. W. Kitchen, Township Clerk, Lovering.

MATILDA, Tp.—Number of buildings erected 3; cost $3,000. Amount expended on permanent improvements $4,500. J. J. Payne, Township Clerk, Brinston.

MATTAWA, Tn.—Good openings for various industries. No new buildings erected. Amount expended on permanent improvements $164. Amount expended on sanitation $443. John McMeekin, Town Clerk, Mattawa.

MATTAWAN, Tp.—Good opening for pulp mill. Number of buildings erected 7; cost $1,000. Amount expended on permanent improvements $3,450. H. F. McMinn, Township Clerk, Mattawa.

MAXVILLE, V.—Saw mill started. Good opening for stove factory, grist mill, sash and door factory. Number of buildings erected, 4; cost $4,000. D. P. McDiarmid, Village Clerk, Maxville.

MAY, Tp.—See Salter, May and Harrow Tps.

MAYO, Tp.—Mining industry started. Amount expended on permanent improvements $800. James Douglas, Township Clerk, Rowland.

MEAFORD, Tn.—Brick and lumber industries started. Owns and operates waterworks; cost $30,000. Good openings for woollen mills, tanneries, flour mill, chopping mill, saw mill, and brick works. Number of buildings erected 50; cost $60,000. Amount expended on permanent improvements $5,000. Amount expended on sanitation $10,000. Geo. G. Albery, Town Clerk, Meaford.

MEDONTE, Tp.—Owns and operates telephone system; cost $20,000. Good opening for cheese factory. Number of buildings erected 28; cost $25,000. Amount expended on permanent improvements $6,500. T. D. Robinson, Township Clerk, Moonstone.

MEDORA AND WOOD, Tps.—Good opening for woodworking machinery. Number of buildings erected 7; cost $8,000. Amount expended on permanent improvements $3,741. Amount expended on sanitation $225. H. C. Guy, Township Clerk, Dudley.

MELANCTHON, Tp.—Number of buildings erected 35; cost $37,000. Amount expended on permanent improvements $7,000. Amount expended on sanitation $50. T. K. Slack, Township Clerk, Melancthon.

MERRICKVILLE, V.—Good openings for various industries. Number of buildings erected 2; cost $2,400. Amount expended on permanent improvements $2,600. D. J. Hall, Village Clerk, Merrickville.

MERRITTON, V.—Basket and bent wood factory started. Owns and operates waterworks, cost $86,181; electric light power, $12,000. Good opening for any kind of industries requiring cheap water power and good shipping facilities. Number of buildings erected 26; cost $65,000. Amount expended on permanent improvements $2,716. Amount expended on sanitation $2,074. R. Clark, Village Clerk, Merritton.

MERSEA, Tp.—Number of buildings erected 26; cost $35,000. Amount expended on permanent improvements $4,000. Amount expended on sanitation $150. Alf. Hairsine, Township Clerk, Leamington.

METCALFE, Tp.—Number of buildings erected 7; cost $5,200. Amount expended on permanent improvements $3,200. Amount expended on sanitation $65. Richard Ward, Township Clerk, Strathroy.

METHUEN, Tp.—See Belmont and Methuen Tps.

MIDDLETON, Tp.—Amount expended on permanent improvements $3,147. D. W. White, Township Clerk, Courtland.

MIDLAND, Tn.—Owns and operates waterworks, cost $94,000; electric light

plant, cost $50,000. Good openings for iron and steel industries, flour mill. Number of buildings erected 40; cost $75,000. Amount expended on permanent improvements $8,000. Amount expended on sanitation $500. F. R. Weston, Town Clerk, Midland.

Millbrook, V.—Creamery and butter factory started. Good openings for furniture factory, canning factory, and sugar beet factory. Number of buildings erected 2; cost $5,000. Amount expended on permanent improvements $1,500. Amount expended on sanitation $200. W. S. Given, Village Clerk, Millbrook.

Miller, Tp.—See Clarendon and Miller Tps.

Milton, Tn.—Electrical industry and shoe factory started. Owns and operates waterworks, valued at $35,000; electric light plant, valued at $15,500. Good openings for almost any kind of industries. Number of buildings erected about 30; cost about $30,000. Amount expended on permanent improvements $13,000. G. A. Hemstreet, Town Clerk, Milton.

Milverton, V.—Good openings for furniture factory and cheese and butter factory. Number of buildings erected 4; cost $1,300. W. D. Weir, Village Clerk, Milverton.

Mimico, V.—Owns and operates hydro-electric system; cost $13,000. Good openings for cabinet and carpet factories. Number of buildings erected 50; cost $50,000. Amount expended on permanent improvements $2,000. Amount expended on sanitation $100. Andrew Dods, Village Clerk, Mimico.

Minden, Tp.—Saw mill started. Number of buildings erected 5; cost $1,000. Amount expended on permanent improvements $540. Amount expended on sanitation $75. E. A. Rogers, Township Clerk, Minden.

Minto, Tp.—Number of buildings erected 9; cost $10,600. Amount expended on permanent improvements $4,000. W. D. McLellan, Township Clerk, Harriston.

Mitchell, Tn.—Owns and operates waterworks and electric light plant; cost $35,000. No new buildings erected. Amount expended on permanent improvements $689. A. S. Cameron, Town Clerk, Mitchell.

Monaghan, N., Tp.—Number of buildings erected 20; cost $30,000. Amount expended on permanent improvements $3,000. Bruce Johnston, Township Clerk, Peterborough.

Monaghan, S., Tp.—Number of buildings erected 3; cost $6,000. Amount expended on permanent improvements $1,600. J. A. Porter, Township Clerk, Monaghan.

Monck, Tp.—Number of buildings erected 26; cost $28,950. Amount expended on permanent improvements $1,673. H. F. Bickmore. Township Clerk, Alport.

Monmouth, Tp.—Number of buildings erected 5; cost $3,000. Amount expended on permanent improvements $200. J. Moore, Township Clerk, Wilberforce.

Mono, Tp.—Number of buildings erected 7; cost $2,500. Amount expended on permanent improvements $13,000. Wm. W. Henry, Township Clerk, Mono Centre.

Monteagle and Herschel, Tps.—Saw mill started. Good openings for furniture factory, pulp factory, planing mills, etc. Number of buildings erected 7; cost $4,700. Amount expended on permanent improvements $1,200. G. A. Jordison, Township Clerk, Maynooth.

Moore, Tp.—Good opening for salt works, tile factory and canning factory. Number of buildings erected 25; cost $15,000. Amount expended on permanent improvements $4,300. Chas. C. Watson, Township Clerk, Brigden.

Morley, Tp.—Saw mill started. Good opening for grist mill and shipping elevator. Number of buildings erected 6; cost $4,000. Amount expended on permanent improvements $2,500. Guy G. Gamsby, Township Clerk, Stratton Station.

Mornington, Tp.—Heading factory started. Number of buildings erected 6; cost $7,700. Amount expended on permanent improvements $3,066. William Waddell, Township Clerk, Burns.

Morris, Tp.—Owns and operates local telephone system; cost $8,000. Number of buildings erected 4; cost $3,500. Amount expended on permanent improvements $4,650. Amount expended on sanitation $25. A. MacEwen, Township Clerk, Bluevale.

Morrisburgh, V.—Owns and operates waterworks, cost $35,000; electric light plant, cost $30,000. Amount expended on permanent improvements $1,817. F. R. Chalmers, Village Clerk, Morrisburgh.

Morrison, Tp.—Number of buildings erected 7; cost $7,700. Amount expended on permanent improvements $300, beside statute labour. J. T. Bayley, Township Clerk, Severn Bridge.

Mosa, Tp.—Good opening for brick and tile factory. Amount expended on permanent improvements $4,069. Amount expended on sanitation $10. John S. Walker, Township Clerk, Glencoe.

Moulton, Tp.—Number of buildings erected 10; cost about $10,000. Amount expended on permanent improvements $700. Amount expended on sanitation $50. W. M. Allen, Township Clerk, Moulton.

Mount Forest, Tn.—Owns and operates waterworks, cost $30,000; electric light plant, cost $15,000. Good opening for furniture factory. Number of buildings erected 3; cost $22,000. W. C. Perry, Town Clerk, Mount Forest.

Mountain, Tp.—Number of buildings erected 4; cost $10,000. Amount expended on permanent improvements $2,654. J. E. Crowder, Township Clerk, Inkerman.

Mulmur, Tp.—Amount expended on permanent improvements $3,800. Geo. Laking, Township Clerk, Shelburne.

Murray, Tp.—Number of buildings erected 4; cost about $4,500. Amount expended on permanent improvements $2,050. Wm. Little, Township Clerk, Wooler.

Muskoka, Tp.—Good opening for flour mill and brick and tile factory. One new building erected; cost about $1,700. Amount expended on permanent improvements $1,266. James Brydon, Township Clerk, Gravenhurst.

Nairn and Lorne, Tps.—Good opening for saw mill, etc. Number of buildings erected 3; cost $1,000. Amount expended on permanent improvements $250. Amount expended on sanitation $10. Jos. A. Edwards, Township Clerk, Nairn Centre.

Napanee, Tn.—Iron works started. Good opening for industries of any character. Number of buildings erected 2; cost $6,000. Amount expended on permanent improvements $1,000. Amount expended on sanitation $21,000. W. A. Grange, Town Clerk, Napanee.

Nassagaweya, Tp.—Number of buildings erected 8; cost $9,000. Amount expended on permanent improvements $6,000. John Marshall, Township Clerk, Eden Mills.

Neebing, Tp.—Good openings for industries of any character. Number of buildings erected ; cost $700. Amount expended on permanent improvements $8,000. W. M. Rae, Township Clerk, Fort William.

Neelon and Garson, Tps.—Smelter started. Good opening for cheese and butter factory. Number of buildings erected 8; cost $4,000. Amount expended on permanent improvements $2,400. Amount expended on sanitation $120. J. R. Vincent, Township Clerk, Box 322, Sudbury.

Nelson, Tp.—Apple drying factory started. Number of buildings erected 12; cost $55,000. Amount expended on permanent improvements $20,000. J. F. Richardson, Township Clerk, Milton.

Nepean, Tp.—Two planing mills started. Good openings for industries of any character. Number of buildings erected 100; cost $100,000. Amount expended on permanent improvements $6,476. A. G. Dawson, Township Clerk, Westboro.

Nepigon, Tp.—Owns and operates waterworks; cost $3,000. Good opening for pulp works, mining, etc. Number of buildings erected 14; cost $20,000. Amount expended on permanent improvements $15,000. Amount expended on sanitation $1,200. J. T. Dudgeon, Township Clerk, Nepigon.

Neustadt, V.—One new building erected; cost $4,000. Amount expended on permanent improvements $750. R. W. Walden, Village Clerk, Neustadt.

New Hamburg, V.—Owns and operates electric power plant; cost $25,000. Openings for any kind of industry. Number of buildings erected 20; cost $30,000. Amount expended on permanent improvements $600. David Eby, Village Clerk, New Hamburg.

New Liskeard, Tn.—Planing mill, marble works, implement industry started. Owns and operates waterworks; cost $85,069. Good opening for box factory, pulp mill, cold storage, and biscuit factory. Number of buildings erected 9; cost $21,900. Amount expended on permanent improvements $4,539. Amount expended on sanitation $8,729. J. I. Dixon, Town Clerk, New Liskeard.

Newboro, V.—Good opening for canning factory. Number of buildings erected 3; cost $1,000. Amount expended on permanent improvements $300. Amount expended on sanitation $5. W. S. Bilton, Village Clerk, Newboro.

Newburgh, V.—Portable band saw mills factory started. Good opening for industries requiring power. Number of buildings erected 4; cost $2,500. C. Welbanks, Village Clerk, Newburgh.

Newbury, V.—Basket factory started. Good opening for harness maker. Number of buildings erected 5; cost $4,750. Amount expended on permanent improvements $130. Charles Tucker, Village Clerk, Newbury.

Newcastle, V.—Good openings for canning factory, general store, livery, contractor for mason work. No new buildings erected. Amount expended on permanent improvements $700. Amount expended on sanitation $50. Geo. Jamieson, Village Clerk, Newcastle.

Newmarket, Tn.—Owns and operates waterworks and electric light plant; cost $42,500. Good openings for various industries. Number of buildings erected 60; cost $60,000. Amount expended on permanent improvements $5,000. J. E. Hughes, Town Clerk, Newmarket.

Niagara, Tn.—Owns and operates waterworks, cost $36,000; electric light plant, cost $24,000. Good opening for basket factory. Number of buildings erected 12; cost $50,300. Amount expended on permanent improvements $1,895. Amount expended on sanitation $2,187. W. E. Lyall, Town Clerk, Niagara.

Niagara, Tp.—Number of buildings erected 4; cost $10,000. Amount expended on permanent improvements $2,000. John Knox, Township Clerk, Virgil.

Niagara Falls, C.—Aluminum factory started. Owns and operates waterworks, cost $217,380; electric light plant, cost $136,973. Good openings for any

industries requiring electric power at a low rate. Number of buildings erected 102; cost $243,500. Amount expended on permanent improvements $35,000. Amount expended on sanitation $10,000. W. J. Seymour, City Clerk, Niagara Falls.

Nicol, Tp.—Good opening for cider, jelly and apple butter mill. Amount expended on permanent improvements $500. J. W. Wissler, Township Clerk, Salem.

Nightingale, Tp.—See Sherborne, etc., Tps.

Nipissing, Tp.—Good opening for industries requiring cheap lumber and hardwood. Number of buildings erected 4; cost $10,000. Amount expended on permanent improvements $932. W. S. Rowson, Township Clerk, Nipissing.

Nissouri, W., Tp.—Number of buildings erected 6; cost $5,000. Amount expended on permanent improvements $7,744. Amount expended on sanitation $116. J. H. Davis, Township Clerk, St. Mary's.

Normanby, Tp.—Good opening for furniture factory. One new building erected; cost $7,000. R. H. Fortune, Township Clerk, Ayton.

North Bay, Tn.—Owns and operates waterworks; cost $175,106. Good openings for industries of all kinds. Number of buildings erected 97; cost $127,406. Amount expended on permanent improvements $20,329. Amount expended on sanitation $50,000. M. W. Flannery, Town Clerk, North Bay.

Norwich, V.—Flour mill started. Owns and operates hydro-electric lighting and power plant; cost $12,000. Good opening for canning factory. Number of buildings erected 4; cost $12,000. Amount expended on permanent improvements $2,100. Wm. Fairley, Village Clerk, Norwich.

Norwich, N., Tp.—Number of buildings erected ; cost $10,000. Amount expended on permanent improvements $4,105. Amount expended on sanitation $81. C. F. Burgess, Township Clerk, Burgessville.

Norwich, S., Tp.—Refrigerator factory and tool handle factory started. Good opening for any kind of manufacturing. Number of buildings erected 6; cost $7,300. Amount expended on permanent improvements $6,465. Alex. McFarlane, Township Clerk, Otterville.

Norwood, V.—No new buildings erected. Amount expended on permanent improvements $400. E. J. Laing, Village Clerk, Norwood.

Nottawasaga, Tp.—Number of buildings erected 2; cost $2,500. Amount expended on permanent improvements $4,603. Amount expended on sanitation $60. L. McAllister, Township Clerk, Duntroon.

Oakland, Tp.—Good opening for canning factory. No new buildings erected. Amount expended on permanent improvements $400. Percy M. Button, Township Clerk, Scotland.

Oakley, Tp.—Saw mill started. Good openings for grist mill and woodenware factory. Number of buildings erected 2; cost $600. Amount expended on permanent improvements $2,000. Henry J. Johnston, Township Clerk, Vankoughnet.

Oakville, Tn.—Owns and operates waterworks, cost $63,038; electric light plant, cost $17,425. Good openings for factories employing skilled labour. Number of buildings erected 42; cost $60,000. Amount expended on permanent improvements $6,531. W. F. Savage, Town Clerk, Oakville.

O'Connor, Tp.—Good opening for brick yard. Number of buildings erected 8; cost $3,500. Amount expended on permanent improvements $727. C. J. Evans, Township Clerk, O'Connor.

Oil Springs, V.—No new buildings erected. Amount expended on permanent improvements $965. Amount expended on sanitation $36. D. P. Sisk, Village Clerk, Oil Springs.

Olden, Tp.—Good openings for woodenware factory and agricultural machinery, etc. Number of buildings erected 3; cost $2,000. Amount expended on permanent improvements $1,600. Amount expended on sanitation $36. W. P. Bender, Township Clerk, Long Lake.

Oliver, Tp.—Owns and operates telephone system; cost $6,500. Number of buildings erected 5; cost $800. Amount expended on permanent improvements $2,562. C. R. B. Hill, Township Clerk, Murillo.

Omemee, Tp.—Good opening for industries of any character. Number of buildings erected 2; cost $15,200. Amount expended on permanent improvements $368. W. H. Kennedy, Township Clerk, Omemee.

Oneida, Tp.—Lime industry started. Good openings for any kind of industries. Amount expended on permanent improvements $1,500. Amount expended on sanitation $42. John Senn, Township Clerk, York.

Onondaga, Tp.—Number of buildings erected 2; cost $1,700. Amount expended on permanent improvements $5,223. S. K. McKelvey, Township Clerk, Tuscarora.

Ops, Tp.—Cement works started. Good openings for industries of any character. Number of buildings erected 7; cost $10,000. Amount expended on permanent improvements $3,855. Amount expended on sanitation $60. W. E. Agnew, Township Clerk, Lindsay.

Orangeville, Tn.—Owns and operates waterworks; cost $52,194. Good openings for furniture factory, boot and shoe factory, woollen and knitting mills. Number of buildings erected 2; cost $2,000. Amount expended on sanitation $42. A. A. Hughson, Town Clerk, Orangeville.

Orford, Tp.—Good opening for foundry or any small manufacturing concern. Number of buildings erected 6; cost $14,500. Amount expended on permanent improvements $4,318. Amount expended on sanitation $223. F. Littlejohns, Township Clerk, Highgate.

Orillia, Tp.—Good opening for canning factory. Number of buildings erected 20; cost $20,000. Amount expended on permanent improvements $4,200. John C. Rose, Township Clerk, Orillia.

Oro, Tp.—Butter factory started. Number of buildings erected 15; cost $15,000. Amount expended on permanent improvements $1,456. H. J. Tudhope, Township Clerk, East Oro.

Oshawa, Tn.—Brick industry started. Owns and operates waterworks; cost $148,269. Openings for shoe factory and iron working machinery. Number of buildings erected 100; cost $200,000. Amount expended on permanent improvements $52,000. Amount expended on sanitation $27,000. Thos. Morris, Town Clerk, Oshawa.

Osgoode Tp.—Amount expended on permanent improvements $5,442. F. Iveson, Township Clerk, Metcalfe.

Osnabruck, Tp.—Hat factory started. Good opening for canning factory and cement works. Number of buildings erected 67; cost $30,000. Amount expended on permanent improvements $4,000. H. E. Hodgins, Township Clerk, Osnabruck Centre.

Oso, Tp.—Good opening for roller mill. Number of buildings erected 2;

cost $5,000. Amount expended on permanent improvements $600. B. Smith, Township Clerk, Sharbot Lake.

Osprey, Tp.—Good openings for woodenware industries, brick making and cement works. Number of buildings erected 30; cost $28,000. Amount expended on permanent improvements $3,203. Amount expended on sanitation $110. Thos. Scott, Township Clerk, McIntyre.

Otonabee, Tp.—Number of buildings erected 3; cost $3,500. Amount expended on permanent improvements $4,416. Amount expended on sanitation, $60. J. M. Drummond, Township Clerk, Keene.

Ottawa, C.—Paper boards (beaver) bindings, paper bags, fireproof woods, dustless floor preparation, loose leaf binder and file metals, stationery specialties, paper boxes, commercial motor cars, taxicabs started. Owns and operates waterworks; cost $2,756,300; electric light and power; cost $430,000. Good openings for automobiles, boxes, bags, biscuits, barrels, bottles, clothing, cigars, confections, cereal foods, elevator and mill building machinery and materials, furniture, flour, gloves, oatmeal, paper, paper-wares, pottery, roller mill products, rubber and felt goods, shirts and collars, shoes, steel castings, tiles, textiles, woodenwares. Number of buildings erected 657; cost $2,997,616. Amount expended on permanent improvements $639,923. Amount expended on sanitation $122,595. John Henderson, City Clerk, Ottawa.

Owen Sound, Tn.—Bolt works, planing mill and nail factory started. Owns and operates waterworks; value $260,659; electric plant; value $120,998; gas plant; value $93,400. Good opening for any kind of industries requiring wood, lime or iron. Number of buildings erected 31; cost $255,000. Amount expended on permanent improvements $19,718. Amount expended on sanitation $10,544. Chas. Gordon, Town Clerk, Owen Sound.

Oxford on Rideau, Tp.—Number of buildings erected 4; cost $5,000. Amount expended on permanent improvements $1,318. Amount expended on sanitation $76. Chas. H. Anderson, Township Clerk, Oxford Mills.

Oxford E., Tp.—Number of buildings erected 4: cost $9,500. Amount expended on permanent improvements $3,044. Amount expended on sanitation $62. F. G. Jackson, Township Clerk, Oxford Centre.

Oxford, N., Tp.—Owns and operates hydro-electric power plant, cost $1,947. Number of buildings erected 5; cost $1,000. Amount expended on permanent improvements $3,000. R. Seldon, Township Clerk, Ingersoll.

Oxford, W., Tp.—Owns and operates hydro-electric power plant; cost $3,553. Number of buildings erected 5; cost $17,000. Amount expended on permanent improvements $5,200. Amount expended on sanitation $107. B. G. Jenvey, Township Clerk, Ingersoll.

Paipoonge, Tp.—Owns debentures in local telephone company. Amount expended on permanent improvements $3,948. Jno. Thornton, Township Clerk, Stanley.

Paisley, V.—Owns and operates waterworks for fire protection; cost $18,000. Good opening for carpet factory. No new buildings erected. Amount expended on permanent improvements $1,000. Amount expended on sanitation $275. J. C. Gibson, Village Clerk, Paisley.

Pakenham, Tp.—Good opening for almost any kind of industry. Number of buildings erected 4; cost about $2,000. Amount expended on permanent improvements $1,200. James Connery, Township Clerk, Cedar Hill.

Palmerston, Tn.—Creamery started. Owns and operates electric light

plant; cost $16,000; waterworks system; cost $45,000. Good openings for iron manufacturing and packing house. Number of buildings erected 4; cost $23,000. Amount expended on permanent improvements $3,000. Amount expended on sanitation $1,500. H. Hyndman, Town Clerk, Palmerston.

PALMERSTON and NORTH and SOUTH CANONTO, Tps.—Number of buildings erected 2; cost $1,600. Amount expended on permanent improvements $100. James Geddes, Township Clerk, McLaren's Depot.

PAPINEAU, Tp.—Number of buildings erected 3; cost $700. C. A. Fink, Township Clerk, Mattawa.

PARIS, Tn.—Owns and operates electric light system; cost $57,000; waterworks system; cost $88,000. Number of buildings erected 20; cost $25,000. Amount expended on permanent improvements $4,299. Amount expended on sanitation $300. Thos. McCosh, Town Clerk, Paris.

PARKE, Tp.—See Korah and Parke Tps.

PARKHILL, Tn.—Good opening for various industries. Number of buildings erected 5; cost $5,000. Amount expended on permanent improvements $5,000. John H. Laughton, Town Clerk, Parkhill.

PARRY SOUND, Tn.—Woodenware factory started. Owns and operates waterworks; cost $63,752; electric light plant; cost $73,629. Good openings for various industries. Number of buildings erected 12; cost $25,000. Amount expended on permanent improvements $2,000. Amount expended on sanitation $1,000. E. E. Armstrong, Town Clerk, Parry Sound.

PEEL, Tp.—Number of buildings erected 8; cost $12,000. Amount expended on permanent improvements $2,000. Amount expended on sanitation $75. Edward Gainer, Township Clerk, Arthur.

PELEE, Tp.—Number of buildings erected 40; cost $28,000. Amount expended on permanent improvements $849. William Stewart, Township Clerk, Pelee Island.

PELHAM, Tp.—Canning factory started. Number of buildings erected 15; cost $20,000. Amount expended on permanent improvements $3,306. Amount expended on sanitation $22. A. M. Armbrust, Township Clerk, Ridgeville.

PEMBROKE, Tn.—Owns and operates waterworks; cost $150,000. Openings for agricultural implements, footwear, etc. Number of buildings erected 12; cost $50,000. Amount expended on permanent improvements $68,000. Amount expended on sanitation $1,000. A. J. Fortier, Town Clerk, Pembroke.

PEMBROKE, Tp.—Good opening for saw mills and woodenware industries. Number of buildings erected 10; cost $2,500. Amount expended on permanent improvements $87. H. W. Perrett, Township Clerk, Pembroke.

PENETANGUISHENE, Tn.—Stove foundry started. Owns and operates waterworks; cost $46,000; electric light and power system; cost $24,000. Good openings for cooperage, felt boots, knitting and woollen mills, woodworking factories, sand, lime, brick works, etc. Number of buildings erected 25; cost $40,000. Amount expended on permanent improvements $500. Amount expended on sanitation $7,425. W. H. Hewson, Town Clerk, Penetanguishene.

PERCY, Tp.—Evaporator and dryer and electric light plant started. Number of buildings erected 5; cost $1,000. Amount expended on permanent improvements $700. P. S. Ewing, Township Clerk, Warkworth.

PERRY, Tp.—Good opening for heading mill and stave factory. No new buildings erected. Amount expended on permanent improvements $24. F. W. Brooks, Township Clerk, Emsdale.

Perth, Tn.—Carpet factory, shoe factory, and kitchen cabinet factory started. Owns and operates street lighting system; valued at $14,000. Good openings for various industries. Number of buildings erected 8; cost $48,000. Amount expended on permanent improvements $1,842. Amount expended on sanitation $7,000. J. A. Kerr, Town Clerk, Perth.

Peterborough, C.—Yarns factory, foundry, pump works and wringer factory started. Owns and operates waterworks; cost $527,661. Openings for industries of any character. Number of buildings erected 201; cost $345,372. Amount expended on permanent improvements $14,223. Amount expended on sanitation $8,670. S. A. Armstrong, City Clerk, Peterborough.

Petewawa, Tp.—Two saw mills started. Good opening for cheese factory. Number of buildings erected 10; cost $2,000. Amount expended on permanent improvements $150. Amount expended on sanitation $6. Fred. Kossatz, Township Clerk, Pembroke.

Petrolea, Tn.—Automobile factory started. Owns and operates waterworks system, cost $190,432. Good opening for furniture factory or knitting factory. Number of buildings erected 6; cost $148,500. Amount expended on permanent improvements $19,500. Amount expended on sanitation $500. J. McHattie, Town Clerk, Petrolea.

Pickering, Tp.—Good opening for canning factory and creamery. Number of buildings erected 15; cost $26,000. Amount expended on permanent improvements $11,732. Amount expended on sanitation $248. D. R. Beaton, Township Clerk, Whitevale.

Picton, Tn.—Canning factory started. Owns and operates waterworks and electric light plant; cost $30,000. Good opening for box factory and broom factory. One new building erected; cost $15,000. Amount expended on permanent improvements $7,189. Amount expended on sanitation $132. R. H. Hubbs, Town Clerk, Picton.

Pilkington, Tp.—One new building erected; cost $3,000. Amount expended on permanent improvements $1,493. G. F. Cromar, Township Clerk, Salem.

Pittsburgh, Tp.—Number of buildings erected 4; cost $4,770. Amount expended on permanent improvements $1,890. Wm. Murray, Township Clerk, Barriefield.

Plantagenet, N., Tp.—Good opening for various industries. Number of buildings erected 8; cost $22,800. Amount expended on permanent improvements $500. D. M. Viau, Township Clerk, Plantagenet.

Plummer, Additional, Tp.—Good opening for saw mill. Number of buildings erected 4; cost $2,500. Amount expended on permanent improvements $1,300. N. H. Peterson, Township Clerk, Bruce Mines.

Plympton, Tp.—Good openings for fruit evaporator, field tile yard, and harness maker. Number of buildings erected 24; cost $12,000. Amount expended on permanent improvements $7,178. Amount expended on sanitation $14. J. K. Cairns, Township Clerk, Camlachie.

Point Edward, V.—Openings for any kind of industries. No new buildings erected. Amount expended on permanent improvements $358. J. F. O'Neil, Village Clerk, Point Edward.

Port Arthur, C.—Waggon works started. Owns and operates street railway, cost $686,380; electric light; cost $108,500; telephone cost $171,700; waterworks; cost $792,705; power plant; cost $374,500. Good openings for industries of any character. Number of buildings erected 215: cost $595,180. Amount

expended on permanent improvements $283,679. Amount expended on sanitation $70,103. W. J. Gurney, Acting City Clerk, Port Arthur.

Port Carling, V.—Number of buildings erected 5; cost $3,000. Amount expended on permanent improvements $780. Amount expended on sanitation $107. F. D. Stubbs, Village Clerk, Port Carling.

Port Colborne, V.—Cork products factory, cement works, and flour mill started. Owns and operates waterworks; cost $30,000. Good openings for various industries. Number of buildings erected 5; cost $15,000. Amount expended on permanent improvements $5,000. Frank D. Noble, Village Clerk, Port Colborne.

Port Dalhousie, V.—Good openings for various industries. Number of buildings erected 5; cost $6,500. Amount expended on permanent improvements $782. Amount expended on sanitation $50. J. M. A. Waugh, Village Clerk, Port Dalhousie.

Port Dover, V.—Number of buildings erected 12; cost $12,100. Amount expended on permanent improvements $3,147. James Sloan, Village Clerk, Port Dover.

Port Elgin, V.—Owns and operates waterworks; cost $42,000. Good openings for saw mill, canning factory, furniture factory, and other woodworking industries. No new buildings erected. Amount expended on permanent improvements $800. D. Geddes, Village Clerk, Port Elgin.

Port Hope, Tn.—Rubber industry started. Owns and operates waterworks; cost $110,000. Good opening for brass and iron foundries. Number of buildings erected 19; cost $50,000. Amount expended on permanent improvements $30,000. Amount expended on sanitation $149. J. W. Sanders, Town Clerk, Port Hope.

Port Perry, V.—Owns and operates waterworks and electric light plant; cost $23,500. Good opening for canneries and milk evaporator. Number of buildings erected 2; cost $6,000. Amount expended on permanent improvements $2,500. W. H. Harris, Village Clerk, Port Perry.

Port Rowan, V.—Street lighting (natural gas); value $150. Good opening for any kind of factory using natural gas. No new buildings erected. Amount expended on permanent improvements $200. W. A. Mabee, Village Clerk, Port Rowan.

Port Stanley, V.—Owns and operates hydro-electric power and light plant; cost about $14,000. Good openings for industries of any character. Number of buildings erected 20; cost $8,000. Amount expended on permanent improvements $972. Amount expended on sanitation $34. James Gough, Village Clerk, Port Stanley.

Portland, Tp.—Number of buildings erected 4; cost $7,000. Amount expended on permanent improvements $4,300. Amount expended on sanitation $44. Thos. A. Kerr, Township Clerk, Harrowsmith.

Portsmouth, V.—No new buildings erected. Amount expended on permanent improvements $540. J. W. Henstridge, Village Clerk, Portsmouth.

Powassan, Tn.—Saw mill started. Good openings for woodenware industries. Number of buildings erected 8; cost $1,500. Amount expended on permanent improvements $800. Amount expended on sanitation $20. L. G. Phillips, Town Clerk, Powassan.

Prescott, Tn.—Owns and operates waterworks and sewage systems; cost $100,000; electric light system; cost $18,000. Good openings for industries of any character. No new buildings erected. Amount expended on permanent

improvements $5,500. Amount expended on sanitation $550. Geo. Rook, Town Clerk, Prescott.

Preston, Tn.—Waggon factory and woodworking machinery works started. Owns and operates waterworks; cost $100,600; electric light and power plant; cost $69,858. Good openings for industries of any character. Number of buildings erected 80; cost $275,000. Amount expended on permanent improvements $919. Amount expended on sanitation $1,886. H. C. Edgar, Town Clerk, Preston.

Prince, Tp.—One new building erected; cost $2,000. Amount expended on permanent improvements $1,195. W. H. Wilson, Township Clerk, Steelton.

Proton, Tp.—Number of buildings erected 10; cost $7,000. Amount expended on permanent improvements $4,000. Thomas Laughlin, Township Clerk, Ventry.

Puslinch, Tp.—Number of buildings erected 10; cost $30,000. Amount expended on sanitation $180. A. B. Falconbridge, Township Clerk, Aberfoyle.

Radcliffe, Tp.—No new buildings erected. Amount expended on permanent improvements $200. J. E. H. Miller, Township Clerk, Combermere.

Raglan, Tp.—No new buildings erected. Amount expended on permanent improvements $121. C. F. Schmelzle, Township Clerk, Jewellville.

Rainham, Tp.—Number of buildings erected 5; cost $6,000. Amount expended on permanent improvements $839. L. F. Culver, Township Clerk, Rainham.

Rainy River, Tn.—Owns and operates waterworks; cost $33,000. Good openings for box factory, sugar factory, sash and door factory, brick yard, etc. Number of buildings erected 17; cost $28,000. Amount expended on permanent improvements $2,500. Amount expended on sanitation $13,000. Sydney Bateman, Town Clerk, Rainy River.

Raleigh, Tp.—Canning factory started. Good opening for tile plant. Number of buildings erected 50; cost $50,000. Amount expended on permanent improvements $5,000. Amount expended on sanitation $250. A. F. Robinson, Township Clerk, Buxton.

Rama, Tp.—Number of buildings erected 12; cost $8,000. Amount expended on permanent improvements $800. W. M. Shields, Township Clerk, O'Connell.

Ramsay, Tp.—Good openings for woollen factory and flour mill. Amount expended on permanent improvements $2,489. Amount expended on sanitation $23. T. A. Thompson, Township Clerk, Almonte.

Ratter and Dunnet, Tps.—Number of buildings erected 2; cost about $1,000. Amount expended on permanent improvements $1,435. Amount expended on sanitation $32. E. Langlois, Township Clerk, Warren.

Rawdon, Tp.—Good opening for canning factory and evaporator. Number of buildings erected 15; cost about $12,000. Amount expended on permanent improvements $4,000. W. F. Bateman, Township Clerk, Spring Brook.

Rayside, Tp.—Good opening for butter and cheese factory. Number of buildings erected 15; cost $3,600. Amount expended on permanent improvements $1,400. Edward Joliat, Township Clerk, Beninville.

Reach, Tp.—Number of buildings erected 7; cost $8,000. Amount expended on permanent improvements $2,750. Amount expended on sanitation $48. W. F. Dobson, Township Clerk, Manchester.

Renfrew, Tn.—Owns and operates waterworks; cost $126,312; power plant; cost $118,207. Good openings for factories. Number of buildings erected 15;

cost $20,000. Amount expended on permanent improvements $92,120. Amount expended on sanitation $2,438. M. Main, Town Clerk, Renfrew.

Richards, Tp.—See Hagarty and Richards Tps.

Richmond, Tp.—Number of buildings erected 2; cost $1,000. Amount expended on permanent improvements $3,100. James McKittrick, Township Clerk, Selby.

Richmond, W., V.—Grist mill started. Good opening for blacksmith shop, printing office, saw mill, harness shop, bakery and laundry. No new buildings erected. Amount expended on permanent improvements $2,100. John Kielby, Village Clerk, Richmond West.

Richmond Hill, V.—Operations begun on an electric light plant at an estimated initial cost of $5,000. Amount expended on permanent improvements $700. A. J. Hume, Village Clerk, Richmond Hill.

Ridgetown, Tn.—Broom factory and basket factory started. Good openings for factories. Number of buildings erected 10; cost $25,000. Amount expended on permanent improvements $5,000. Amount expended on sanitation $500. D. Cochrane, Town Clerk, Ridgetown.

Rochester, Tp.—Owns and operates telephone system; value $13,479. Good opening for canning factory. Number of buildings erected 3; cost $2,100. Amount expended on permanent improvements $1,853. Amount expended on sanitation $4,230. M. N. Mousseau, Township Clerk, Woodslee.

Rockland, Tn.—Planing mill started. Good openings for furniture factory and brick or cement factory. Number of buildings erected 11; cost $5,000. Amount expended on permanent improvements $2,500. Amount expended on sanitation $2,500. James N. Lagrois, Town Clerk, Rockland.

Rodney, V.—Pickle factory started. Good openings for furniture factory and foundry. J. D. Shaw, Village Clerk, Rodney.

Rolph, Buchanan and Wylie Tps.—Number of buildings erected 3; cost $1,000. Amount expended on permanent improvements $540. Florence McCarthy, Township Clerk, Wylie.

Romney, Tp.—Good openings for canning factory and pork packing establishment. Number of buildings erected 4; cost $10,000. Amount expended on permanent improvements $1,000. Amount expended on sanitation $50. J. W. Kennedy, Township Clerk, Wheatley.

Ross, Tp.—Good openings for various industries. Number of buildings erected 12; cost $10,000. Amount expended on permanent improvements $1,600. Amount expended on sanitation $64. P. R. Pounder, Township Clerk, Forester's Falls.

Roxborough, Tp.—Number of buildings erected 43; cost $12,000. Amount expended on permanent improvements $2,200. D. A. McDiarmid, Township Clerk, Sandringham.

Russell, Tp.—Shale pressed brick industry started. Good opening for pottery. Number of buildings erected 125; cost $150,000. Amount expended on permanent improvements $20,000. W. J. Lowrie, Township Clerk, Russell.

Ryde, Tp.—Amount expended on permanent improvements $2,000. William Lowe, Township Clerk, Bracebridge.

Ryerson, Tp.—Number of buildings erected 3; cost $3,000. Amount expended on permanent improvements $502. Amount expended on sanitation $43. C. McArthur, Township Clerk, Burk's Falls.

St. Catharines, C.—Locks and builders' supplies factory, automobile factory,

and woollen factory started. Owns and operates waterworks; cost $520,000: gas plant; cost $100,000. Good openings for various industries. Number of buildings erected 134; cost $280,450. Amount expended on permanent improvements $60,500. Amount expended on sanitation $10,000. J. Albert Pay, City Clerk, St. Catharines.

St. Edmunds, Tp.—Number of buildings erected 3; cost $21,100. Amount expended on permanent improvements $1,200. Amount expended on sanitation $15. Lytle Spears, Township Clerk, Tobermory.

St. Joseph, Tp.—Number of buildings erected 6; cost $5,100. Amount expended on permanent improvements $1,433. Amount expended on sanitation $32. H. M. Ross, Township Clerk, Richard's Landing.

St. Mary's, Tn.—Owns and operates waterworks; cost $70,000; electric light plant; cost $29,000; power plant; cost $15,000. Openings for various industries. Number of buildings erected 4; cost $10,000. Amount expended on permanent improvements $23,163. Thos. M. Clark, Town Clerk, St. Mary's.

St. Thomas, C.—Knitting factory started. Owns and operates waterworks; value $300,000; gas works; value $200,000; electric light plant; value $75,000; street railway plant; value $75,000. Good openings for any kind of iron industry. Number of buildings erected 146; cost $285,515. Amount expended on permanent improvements $15,200. Amount expended on sanitation $1,780. W. B. Doherty, City Clerk, St. Thomas.

St. Vincent, Tp.—Brick factory started. Good openings for brick, cement and line industries. Amount expended on permanent improvements $6,000. Geo. G. Albery, Township Clerk, Meaford.

Salter, May and Harrow Tps.—Good openings for cheese factories. Number of buildings erected 15; cost $7,000. Amount expended on permanent improvements $200. Amount expended on sanitation $20. Oscar Cole, Township Clerk, Massey.

Saltfleet, Tp.—Good openings for lumber mills, tile and cement factories, canning factory. Number of buildings erected 50; cost $60,000. Amount expended on permanent improvements $5,000. Amount expended on sanitation $180. Erland Lee, Township Clerk, Stoney Creek.

Sandfield, Tp.—Openings for planing mill, lath and shingle mill, sash and door factory. Amount expended on permanent improvements $100. T. W. Thomson, Township Clerk, Big Lake.

Sandwich, Tn.—Additional salt works started. Good openings for industries of any character. Number of buildings erected 43; cost $196,090. Amount expended on permanent improvements $5,710. Amount expended on sanitation $14,336. E. R. North, Town Clerk, Sandwich.

Sandwich, S., Tp.—Good opening for canning factories. Number of buildings erected 21; cost $9,860. Amount expended on permanent improvements $3,250. Amount expended on sanitation $42. John McAuliffe, Township Clerk, Maidstone.

Sandwich, W., Tp.—Good opening for steel plant. Number of buildings erected 52; cost $41,600. Amount expended on permanent improvements $5,500. Ernest Bondy, Township Clerk, Canard River.

Sarawak, Tp.—Number of buildings erected 2: cost $2,500. Amount expended on permanent improvements $410. Wm. Morton, Township Clerk, East Linton.

Sarnia, Tn.—Planing mill, sash and door factory and dish washing machinery

started. Owns and operates waterworks; cost $207,946. Good opening for any class of industry. Number of buildings erected 13; cost $57,800. Amount expended on permanent improvements $3,027. Amount expended on sanitation $1,555. J. D. Stewart, Town Clerk, Sarnia.

Sarnia, Tp.—Number of buildings erected 10; cost $10,000. Amount expended on permanent improvements $5,000. Amount expended on sanitation $20,000. H. D. Kewley, Township Clerk, Sarnia.

Saugeen, Tp.—Number of buildings erected 3; cost $3,000. Amount expended on permanent improvements $4,800. F. W. Elliott, Township Clerk, Port Elgin.

Sault Ste. Marie, Tn.—Good openings for industries of any character. Number of buildings erected 204; cost $2,374,372. Amount expended on permanent improvements $23,716. Amount expended on sanitation $26,059. C. J. Pim, Town Clerk, Sault Ste. Marie.

Scarborough, Tp.—No new buildings erected. Amount expended on permanent improvements $3,500. Thos. Crawford, Township Clerk, Agincourt.

Schreiber, Tp.—Number of buildings erected 9; cost $12,500. Geo. A. Evans, Township Clerk, Schreiber.

Scott, Tp.—Number of buildings erected 6; cost $7,200. Amount expended on permanent improvements $1,650. Amount expended on sanitation $27. Allan Gray, Township Clerk, Uxbridge.

Scugog, Tp.—Number of buildings erected 11; cost $7,750. Amount expended on permanent improvements $500. Thomas Graham, Township Clerk, Port Perry.

Seaforth, Tn.—Owns and operates waterworks, cost $17,000.; electric light plant, cost $25,000. Good openings for linen mill and woollen mill. One new building erected; cost $3,000. Amount expended on permanent improvements, $1,846. Amount expended on sanitation, $800. J. A. Wilson, Town Clerk, Seaforth.

Sebastopol, Tp.—Good opening for creamery and mining industry. No new buildings erected. Amount expended on permanent improvements, $64. C. Walther, Township Clerk, Vanbrugh.

Seneca, Tp.—Number of buildings erected 4; cost $5,000. Amount expended on permanent improvements $2,000. N. H. Wickett, Township Clerk, York.

Seymour, Tp.—Good openings for industries of any character. Amount expended on permanent improvements $7,878. J. B. Ferris, Township Clerk, Campbellford.

Shallow Lake, V.—Good opening for woodenware or furniture factory. One new building erected: cost about $600. Amount expended on permanent improvements $100. R. E. Young, Village Clerk, Shallow Lake.

Sheffield, Tp.—Number of buildings erected 5; cost $13,700. Amount expended on permanent improvements $688. J. Aylesworth, Township Clerk, Tamworth.

Shelburne, V.—Owns and operates waterworks: cost $22,000. Opening for planing mills. Number of buildings erected 3; cost $12,000. Amount expended on permanent improvements $3,000. Thos. Whatley, Village Clerk, Shelburne.

Sherborne, etc., Tps.—Number of buildings erected 6; cost $3,000. Amount expended on permanent improvements $450. Amount expended on sanitation $20. W. C. Sparks, Township Clerk, Dorset.

Sherbrooke, Tp.—Number of buildings erected 3; cost $1,400. Amount

expended on permanent improvements $225. L. McCallum, Township Clerk, Stromness.

Sherbrooke, N., Tp.—See Dalhousie and Sherbrooke, N., Tps.

Sherbrooke, S., Tp.—Good opening for a baker. Number of buildings erected 2; cost $1,500. Amount expended on permanent improvements $300. Alfred Morrison, Township Clerk, Maberley.

Sherwood, Jones and Burns, Tps.—Good opening for hardwood factory. Number of buildings erected 20; cost $3,000. Amount expended on permanent improvements $400. S. E. Smith, Township Clerk, Barry's Bay.

Shuniah, Tp.—No new buildings erected. Amount expended on permanent improvements $33,000. H. A. McKibbon, Township Clerk, Port Arthur.

Sidney, Tp.—Good opening for industries requiring waterpower. Number of buildings erected 20; cost $20,000. Amount expended on permanent improvements $5,500. Amount expended on sanitation $525. A. M. Chapman, Township Clerk, Belleville.

Simcoe, Tn.—Lithographing industry, fertilizer industry, cement blocks and tile industry, greenhouses and mushrooms started. Owns and operates waterworks; cost $81,000. Good openings for box factory, windmills and pumps. Number of buildings erected 18: cost $22,000. Amount expended on permanent improvements $2,100. Amount expended on sanitation $100. W. C. McCall, Town Clerk, Simcoe.

Smith, Tp.—Number of buildings erected 11; cost $6,000. Amount expended on permanent improvements $2,792. Amount expended on sanitation $114. J. W. Kelly, Township Clerk, Bridgenorth.

Smith's Falls, Tn.—Owns and operates waterworks: value $200,000. Good openings for industries of any character. Number of buildings erected 63; cost $250,000. Amount expended on permanent improvements $3,000. Amount expended on sanitation $7,000. J. A. Lewis, Town Clerk, Smith's Falls.

Snowden, Tp.—Number of buildings erected 3; cost $1,000. A. J. Scott, Township Clerk, Gelert.

Sombra, Tp.—Good opening for cement and tile works, butter factory, etc. Amount expended on permanent improvements $11,109. Amount expended on sanitation $162. W. H. McGhee, Township Clerk, Wilkesport.

Somerville, Tp.—Good openings for brick yard and lime kiln. Amount expended on permanent improvements $1,432. Samuel Suddaby, Township Clerk, Burnt River.

Sophiasburg, Tp.—Number of buildings erected 6: cost $6,000. Amount expended on permanent improvements $1,865. C. H. Wright, Township Clerk, Demorestville.

South River, V.—Good opening for woodworking industries. Number of buildings erected 10: cost $4,000. Amount expended on permanent improvements $3,000. H. O. Boorse, Village Clerk, South River.

Southampton, Tn.—Owns and operates waterworks; value $46,000. Good opening for woodworking factories. Number of dwellings erected 18; cost $121,000. Amount expended on permanent improvements $526. Amount expended on sanitation $53. J. C. Eckford, Town Clerk, Southampton.

Southwold, Tp.—Number of buildings erected 4: cost $5,500. Amount expended on permanent improvements $10,000. L. C. McLennan, Township Clerk, Fingal.

Springer, Tp.—Number of buildings erected 10; cost $3,000. Amount ex-

pended on permanent improvements $2,000. Amount expended on sanitation $200. Onesime Lafrance, Township Clerk, Sturgeon Falls.

Springfield, V.—Good openings for canning factory, general store, and a medical practitioner. No new buildings erected. Amount expended on permanent improvements $683. Amount expended on sanitation $6. J. B. Lucas, Village Clerk, Springfield.

Stafford, Tp.—Good opening for brick and tile yard. Number of buildings erected 6; cost $10,000. Amount expended on permanent improvements $1,300. John Kidd, Township Clerk, Micksburg.

Stamford, Tp.—Good opening for any kind of industry requiring electric power. Number of buildings erected 45; cost $60,000. Amount expended on permanent improvements $1,600. C. F. Monroe, Township Clerk, South End.

Stanhope, Tp.—One new building erected; cost about $840. Amount expended on permanent improvements $112. William Cooper, Township Clerk, Boskung.

Stanley, Tp.—Good opening for creamery or cheese factory. Number of buildings erected 12; cost $10,000. Amount expended on permanent improvements $4,000. Robert J. Richardson, Township Clerk, Varna.

Stayner, Tn.—Owns and operates waterworks; cost $24,000. Good opening for canning factory. No new buildings erected. Amount expended on permanent improvements $282. John Hood, Town Clerk, Stayner.

Steelton, Tn.—Extension of Algoma Steel Company. Owns and operates waterworks system; cost $80,000; electric light system; cost $30,000. Good opening for lumber yard and planing mills, furniture factories, etc. Number of buildings erected 150; cost $2,216,925. Amount expended on permanent improvements $68,000. Amount expended on sanitation $41,200. J. Robinson, Town Clerk, Steelton.

Stephen, Tp.—Number of buildings erected 20; cost $25,000. Amount expended on permanent improvements $6,000. Henry Eilber, Township Clerk, Crediton.

Stephenson, Tp.—Number of buildings erected 8; cost $4,500. Amount expended on permanent improvements $2,046. Daniel Bain, Township Clerk, Utterson.

Stirling, V.—Owns and operates electric plant; value $11,000. Good opening for sash factory and canning factory. One new building erected; cost $12,000. Amount expended on permanent improvements $8,000. J. S. Morton, Village Clerk, Stirling.

Stisted, Tp.—Saw mill started. Number of buildings erected 6; cost $2,000. Amount expended on permanent improvements $294. William Quinn, Township Clerk, Yearley.

Sterrington, Tp.—Number of buildings erected 5; cost $5,000. Amount expended on permanent improvements $2,000. H. J. Morland, Township Clerk, Sunbury.

Stouffville, V.—Owns and operates waterworks; cost $25,000. Good opening for canning factory and iron foundry. Number of buildings erected 2; cost $2,000. Amount expended on permanent improvements $835. J. Urquhart, Village Clerk, Stouffville.

Stratford, C.—Music cabinets and piano seats industry started. Owns and operates waterworks; cost $264,187; electric light plant; cost $148,186. Good openings for stove foundry, metal bedsteads, carpets, carriages, waggons, auto-

mobiles, whitewear, shoe factory, linen mill, thread mill, brass foundry, cotton mills, trunk factory, rubber works, and upholstered furniture. Number of buildings erected 50; cost $100,000. Amount expended on permanent improvements $78,186. Amount expended on sanitation $2,710. R. R. Lang, City Clerk, Stratford.

Strathroy, Tn.—Owns and operates waterworks and lighting plant; cost about $60,000. Good opening for woollen mills and furniture factories. One new building erected; cost $1,500. Amount expended on permanent improvements $1,500. Amount expended on sanitation $500. F. W. Atkinson, Town Clerk, Strathroy.

Streetsville, V.—Owns and operates waterworks and electric light plant: cost $27,500. Good openings for canning factory, brick works, etc. No new buildings erected. Amount expended on permanent improvements $1,500. S. H. Smith, Village Clerk, Streetsville.

Strong, Tp.—Good openings for furniture factory, cement plant, grist mill, veneer or woodwork plant. Number of buildings erected 3; cost $3,000. Amount expended on permanent improvements $1,000. Amount expended on sanitation $15. A. M. Church, Township Clerk, Sundridge.

Sturgeon Falls, Tn.—Owns and operates waterworks system, cost $44,379. Good openings for flour mill, lumber mill, etc. No new buildings erected. Amount expended on permanent improvements, $1,172. Amount expended on sanitation, $1,016. J. D. Cockburn, Town Clerk, Sturgeon Falls.

Sudbury, Tn.—Owns and operates waterworks and electric light plant, cost $151,873. Good openings for industries requiring electric power. Number of buildings erected, 125; cost $200,000. Amount expended on permanent improvements, $9,689. Amount expended on sanitation, $5,571. Geo. Elliott, Town Clerk, Sudbury.

Sullivan, Tp.—Number of buildings erected, 5; cost $7,000. Amount expended on permanent improvements, $5,843 (including statute labour). A Stephen, Township Clerk, Desboro.

Sundridge, V.—Good openings for planing mill, furniture factory, etc. No new buildings erected. Amount expended on permanent improvements, $118. John Harper, Village Clerk, Sundridge.

Sunnidale, Tp.—Good opening for cement works. Number of new buildings erected, 10; cost $15,000. Amount expended on permanent improvements, $3,000. Amount expended on sanitation, $60. T. F. Burrows, Township Clerk, Stayner.

Sutton, V.—Good openings for woollen mill and canning factory. Number of buildings erected, 2; cost about $4,500. Amount expended on permanent improvements, $500. Amount expended on sanitation, $15. T. G. Tremayne, Village Clerk, Sutton West.

Sydenham, Tp.—Number of buildings erected, 10; cost $10,000. Amount expended on permanent improvements, $3,727. James Cannon, Township Clerk, Annan.

Tara, V.—Good openings for various industries. No new buildings erected. Amount expended on permanent improvements, $100. Amount expended on sanitation, $33. W. J. Taylor, Village Clerk, Tara.

Tarentorus, Tp.—Stone quarry started. Number of buildings erected, 46; cost $12,150. Amount expended on permanent improvements, $4,562. B. R. McMullin, Township Clerk, Sault Ste. Marie.

Tavistock, V.—Owns and operates waterworks, cost $20,000. Good opening

for foundry. Number of buildings erected, 2; cost $4,000. Amount expended on permanent improvements, $2,500. J. G. Field, Village Clerk, Tavistock.

Tay, Tp.—Good openings for all kinds of manufacturing. Amount expended on permanent improvements, $2,450. T. W. Brown, Township Clerk, Victoria Harbour.

Tecumseth, Tp.—Number of buildings erected, 25; cost $75,000. Amount expended on permanent improvements, $3,000. William Lilly, Township Clerk, Beeton.

Teeswater, V.—Owns and operates waterworks for fire protection only, cost about $15,000. Good openings for wood or iron works. Number of buildings erected, 2; cost $5,000. Amount expended on permanent improvements, $200. John Farquharson, Village Clerk, Teeswater.

Tehkummah, Tp.—No new buildings erected. Amount expended on permanent improvements, $1,500. J. E. Hopkins, Township Clerk, Tehkummah.

Thamesville, V.—Owns and operates waterworks, cost $17,500; electric light plant, cost $6,250. Good openings for creamery, flax mill, meat packing industry, sugar beet factory, etc. One new building erected; cost $8,000. Amount expended on permanent improvements, $500. W. J. Cryderman, Village Clerk, Thamesville.

Thedford, V.—No new buildings erected. Amount expended on permanent improvements, $750. Amount expended on sanitation, $10. Wm. Brooks, Village Clerk, Thedford.

Thessalon, Tn.—Owns and operates waterworks and electric light plant, valued at $40,000. Good opening for any kind of hardwood industry. Number of buildings erected, 6; cost $12,200. Amount expended on permanent improvements, $1,092. Amount expended on sanitation, $54. E. G. Scott, Town Clerk, Thessalon.

Thessalon, Tp.—Number of buildings erected, 5; cost $7,000. Amount expended on permanent improvements, $900. Amount expended on sanitation, $20. T. E. Clinton, Township Clerk, Thessalon.

Thompson, Tp.—Good openings for blacksmith shop and box factory. Number of buildings erected, 2; cost $300. Amount expended on permanent improvements, $250. A. Graham, Township Clerk, Dean Lake.

Thornbury, Tn.—Good openings for industries requiring water power. Number of buildings erected, 11; cost $13,900. Amount expended on permanent improvements, $1,546. E. Rorke, Town Clerk, Thornbury.

Thorold, Tn.—Pulp mill and pulp board mill started. Owns and operates waterworks, cost $100,000; electric light plant, cost $30,000. Number of buildings erected, 5; cost $20,000. Amount expended on permanent improvements $6,000. Amount expended on sanitation, $13,355. D. J. C. Munro, Town Clerk, Thorold.

Thorold, Tp.—Good openings for various industries. Number of buildings erected, 5; cost $5,500. Amount expended on permanent improvements, $2,600. Amount expended on sanitation, $25. J. A. Clark, Township Clerk, Fonthill.

Thurlow, Tp.—Good openings for canning factory, barrel factory, and tanneries. Number of buildings erected, 6; cost $3,000. Amount expended on permanent improvements, $2,000. C. A. Callery, Township Clerk, Canifton.

Tilbury, Tn.—Top factory started. Owns and operates waterworks, cost $10,500. Good opening for broom factory. Number of buildings erected, 5; cost $12,000. Amount expended on permanent improvements, $1,500. Amount expended on sanitation, $393. W. A. Hutton, Town Clerk, Tilbury.

Tilbury, E., Tp.—Amount expended on permanent improvements, $4,047. Amount expended on sanitation, $4,690. Alex. Farquharson Township Clerk, Fletcher.

Tilbury, N., Tp.—Number of buildings erected, 20; cost $15,000. Amount expended on permanent improvements, $5,000. J. A. Tremblay, Township Clerk, Tilbury.

Tilbury, W., Tp.—Good opening for pork packing industry. Number of buildings erected, 27; cost $17,000. Amount expended on permanent improvements, $1,200. Amount expended on sanitation, $40. S. T. Anderson, Township Clerk, Comber.

Tillsonburg, Tn.—Owns and operates electric light and power plant, cost $35,000. Good openings for various industries. Number of buildings erected, 20; cost $30,000. Amount expended on permanent improvements, $10,000. Amount expended on sanitation, $12,000. C. H. Livingstone, Town Clerk, Tillsonburg.

Tiny, Tp.—Number of buildings erected, 8; cost $7,000. Amount expended on permanent improvements, $10,000. M. Beaudoin, Township Clerk, Lafontaine.

Tisdale, Tp.—Number of buildings erected, about 300; cost about $300,000. W. M. Whyte, Township Clerk, South Porcupine.

Tiverton, V.—No new buildings erected. Amount expended on permanent improvements, $500. Amount expended on sanitation, $25. R. N. Blair, Village Clerk, Tiverton.

Torbolton, Tp.—Amount expended on permanent improvements, $532. Amount expended on sanitation, $10. D. B. Maclaren, Township Clerk, Dirleton.

Toronto, C.—Owns and operates waterworks, cost about $8,500,000; electric light plant, cost about $4,950,000. Good openings for industries of various character. Number of buildings erected, 9,867; cost $24,374,529. Amount expended on permanent improvements $1,885,884. Amount expended on sanitation, $1,700,139. W. A. Littlejohn, City Clerk, Toronto.

Toronto, Tp.—Good openings for planing mill, canning factory and basket factory. Number of buildings erected, 10; cost $25,000. Amount expended on permanent improvements, $10,000. C. H. Gill, Township Clerk, Dixie.

Toronto Gore, Tp.—Number of buildings erected, 4; cost $8,000. Amount expended on permanent improvements, $5,000. N. Harrison, Township Clerk, Castlemore.

Toronto, N., Tn.—Leather goods factory started. Owns and operates waterworks, cost $74,891; electric light plant, cost $30,000. Good opening for any kind of light manufacturing. Number of buildings erected, 241; cost $381,588. Amount expended on permanent improvements, $70,491. Amount expended on sanitation, $137,368. W. C. Norman, Town Clerk, Eglinton.

Tossoronto, Tp.—Number of buildings erected, 8; cost $8,000. Amount expended on permanent improvements, $1,500. Thomas Irwin, Township Clerk, Lisle.

Tottenham, V.—Sash and door factory started. Owns and operates electric light plant; cost $6,000. Good openings for furniture factories, boot and shoe factories, foundries, etc. One new building erected; cost $1,000. Amount expended on permanent improvements, $805. S. H. Nolan, Village Clerk, Tottenham.

Townsend, Tp.—Good opening for tile and brick yard. Number of buildings erected, 10; cost $15,000. Amount expended on permanent improvements, $3,333. Amount expended on sanitation, $107. James Ross, Township Clerk, Waterford.

Trafalgar, Tp.—Good opening for brick yard. Amount expended on permanent improvements, $6,000. Chas. Hall, Township Clerk, Trafalgar.

Trenton, Tn.—Go-cart factory started. Good openings for industries requiring electric power. Number of buildings erected, 17; cost $49,000. Amount expended on permanent improvements $4,000. Amount expended on sanitation, $300. G. W. Ostrum, Town Clerk, Trenton.

Tuckersmith, Tp.—Number of buildings erected, 5; cost $4,500. Amount expended on permanent improvements, $5,713. D. F. McGregor, Township Clerk, Seaforth.

Tudor and Cashel, Tps.—Good opening for mining industry. One new building erected, cost $1,800. Amount expended on permanent improvements, $1,548. Wm. Glennie, Township Clerk, Millbridge.

Turnbury, Tp.—Number of buildings erected, 12; cost $10,000. Amount expended on permanent improvements, $5,500. John Burgess, Township Clerk, Bluevale.

Tweed, V.—Good openings for industries requiring electric power. Number of buildings erected, 2; cost $4,000. Amount expended on sanitation, $700. P. T. Bowlby, Village Clerk, Tweed.

Tyendinaga, Tp.—Good opening for cheese factory. Number of buildings erected, 7; cost $5,000. Amount expended on permanent improvements, $1,921. P. Shaughnessy, Township Clerk, Melrose.

Usborne, Tp.—Number of buildings erected, 8; cost $15,000. Amount expended on permanent improvements,, $3,315. Amount expended on sanitation, $10. Francis Morley, Township Clerk, Whalen.

Uxbridge, Tn.—Wood carving industry started. Good opening for brick factory. One new building erected; cost $19,000. Amount expended on permanent improvements, $653. Amount expended on sanitation, $2,300. M. H. Crosby, Town Clerk, Uxbridge.

Uxbridge, Tp.—Number of buildings erected, 10; cost $8,000. Amount expended on permanent improvements, $1,837. Amount expended on sanitation, $46. J. H. Millard, Township Clerk, Altona.

Van Horne, Tp.—Good opening for grist mill. Number of buildings erected, 2; cost $1,000. Thomas Marshall, Township Clerk, Dryden.

Vankleek Hill, Tn.—Good openings for carriage or waggon factory, canning factory. No new buildings erected. Amount expended on permanent improvements, $1,100. H. C. Jones, Town Clerk, Vankleek Hill.

Vaughan, Tp.—Number of buildings erected, 20; cost $20,000. Amount expended on permanent improvements, $6,065. J. B. McLean, Township Clerk, Maple.

Verulam, Tp.—Good opening for industries requiring electric power. Number of buildings erected, 6; cost $3,400. Amount expended on permanent improvements, $2,900. G. W. Taylor, Township Clerk, Bobcaygeon.

Vespra, Tp.—Number of buildings erected, 20; cost $20,000. Amount expended on permanent improvements, $15,000. Amount expended on sanitation, $100. A. B. Coutts, Township Clerk, Barrie.

Vienna, V.—Good opening for any kind of industry. One new building erected; cost $200. Amount expended on permanent improvements, $420. S. S. Clutton, Village Clerk, Vienna.

Victoria Harbour, V.—Good openings for industries requiring electric power. Number of buildings erected, 18; cost $13,500. Amount expended on

permanent improvements, $1,609. Amount expended on sanitation, $50. E. B. Brown, Village Clerk, Victoria Harbour.

WAINFLEET, Tp.—Amount expended on permanent improvements, $2,750. Jos. Henderson, Jr., Township Clerk, Marshville.

WALKERTON, Tn.—Biscuit factory started. Owns and operates waterworks; cost $45,000. Number of buildings erected, 4; cost $7,500. Amount expended on permanent improvements, $2,000. Amount expended on sanitation, $600. J. H. Scott, Town Clerk, Walkerton.

WALKERVILLE, Tn.—Ranges, auto parts, cranes and machines, paint works and auto tops industries started. Good openings for industries of any character. Number of buildings erected, 67; cost $218,105. Amount expended on permanent improvements, $88,885. Amount expended on sanitation, $7,100. Cecil H. Robinson, Town Clerk, Walkerville.

WALLACE, Tp.—Number of buildings erected, 12; cost $22,000. Amount expended on permanent improvements, $3,000. David Greer, Township Clerk, Brotherston.

WALLACEBURG, Tn.—Good openings for factories of any character. Number of buildings erected, 28; cost $122,475. Amount expended on permanent improvements, $30,000. Amount expended on sanitation, $1,000. H. E. Johnson, Town Clerk, Wallaceburg.

WALPOLE, Tp.—Good opening for brick and tile factory. Number of buildings erected, 14; cost $8,500. Amount expended on permanent improvements, $8,694. Amount expended on sanitation, $34. S. A. Thompson, Township Clerk, Nanticoke.

WALSINGHAM, N., Tp.—Number of buildings erected, 5; cost $4,000. Amount expended on permanent improvements, $2,873. Edgar J. Hodson, Township Clerk, Langton.

WALSINGHAM, S., Tp.—Cheese and butter factory started. Number of buildings erected, 9; cost $3,900. Amount expended on permanent improvements, $2,500. W. M. Townsend, Township Clerk, Walsingham Centre.

WARDSVILLE, V.—Good opening for canning factory and woollen mill. One new building erected; cost $1,200. Amount expended on permanent improvements, $200. W. A. Mimna, Village Clerk, Wardsville.

WARWICK, Tp.—Good opening for brick yard. Number of buildings erected, 6; cost $3,000. Amount expended on permanent improvements, $2,500. Amount expended on sanitation, $21. N. Herbert, Township Clerk, Warwick.

WATERDOWN, V.—Flour and feed industry started. Owns and operates hydro-electric plant for power, etc.: cost $6,500. Good openings for basket factory, canning factory, grist mill. No new buildings erected. Amount expended on permanent improvements, $1,500. Amount expended on sanitation, $24. J. C. Medlar, Village Clerk, Waterdown.

WATERFORD, V.—Opening for sash and door factory. Number of buildings erected, 2; cost $3,000. Amount expended on permanent improvements, $443. Amount expended on sanitation, $30. James Ross, Village Clerk, Waterford.

WATERLOO, Tn.—Tannery, trunk factory, and shirt and collar factory started. Owns and operates waterworks, cost $100,000; gas works, cost $42,600; electric lighting, cost $55,700. Good opening for saw mill and general contractor. Number of buildings erected, 60; cost $150,000. Amount expended on permanent improvements, $41,500. Amount expended on sanitation, $4,236. James C. Haight, Town Clerk, Waterloo.

Waterloo, Tp.—Number of buildings erected, 21; cost $18,000. Amount expended on permanent improvements, $2,100. Geo. A. Tilt, Township Clerk, Blair.

Waters, Tp.—Good opening for creamery. Number of buildings erected, 4; cost $2,000. Amount expended on permanent improvements, $795. P. G. Gaudrault, Township Clerk, Copper Cliff.

Waterford, V.—One new building erected; cost $3,000. Amount expended on permanent improvements, $201. W. S. Fuller, Village Clerk, Watford.

Watt, Tp.—Two saw mills started. Number of buildings erected, 5; cost $2,000. Amount expended on permanent improvements, $1,541. Edward Hamilton, Township Clerk, Raymond.

Wawanosh, E., Tp.—Number of buildings erected, 5; cost $3,450. Amount expended on permanent improvements, $11,569. Amount expended on sanitation, $66. Alex. Porterfield, Township Clerk, Marnoch.

Wawanosh, W., Tp.—Number of buildings erected, 4; cost $8,000. Amount expended on permanent improvements, $1,000. Amount expended on sanitation, $50. W. S. McCrostie, Township Clerk, Belfast.

Webbwood, Tn.—Number of buildings erected, 6; cost $4,500. Amount expended on permanent improvements, $400. Amount expended on sanitation, $175. Thos. Brinsmead, Town Clerk, Webbwood.

Welland, Tn.—Owns and operates waterworks; cost $165,000. Openings for all kinds of factories. Number of buildings erected, 108; cost $324,000. Amount expended on permanent improvements, $18,941. Amount expended on sanitation, $9,800. George R. Boyd, Town Clerk, Welland.

Wellesley, Tp.—Number of buildings erected, 25; cost $12,800. Amount expended on permanent improvements, $6,407. Amount expended on sanitation, $126. P. F. Schummer, Township Clerk, St. Clements.

Wellington, V.—Good openings for almost every industry except canning. Number of buildings erected, 2; cost $3,000. Amount expended on permanent improvements, $960. Amount expended on sanitation, $94. E. A. Titus, Village Clerk, Wellington.

West Lorne, V.—Good opening for furniture factory and other wood-working industries. Number of buildings erected, 12; cost $14,400. Amount expended on permanent improvements, $2,000. Dan. McKillop, Village Clerk, West Lorne.

Westmeath, Tp.—Amount expended on permanent improvements, $3,042. Amount expended on sanitation, $1,500. Hugh H. Miller, Township Clerk, Beachburg.

Westminster, Tp.—Amount expended on permanent improvements, $7,441. Amount expended on sanitation, $135. George Riddell, Township Clerk, London.

Weston, V.—Owns and operates waterworks system, value $80,000; electric light system, value $27,000. Good openings for factories. Number of buildings erected, 30; cost $70,000. Amount expended on permanent improvements, $1,032. J. H. Taylor, Village Clerk, Weston.

Westport, V.—Plating factory started. Number of buildings erected, 4; cost $10,950. Amount expended on permanent improvements, $2,000. W. S. Ripley, Village Clerk, Westport.

Whitby, Tn.—Owns and operates waterworks and electric light plant, cost $90,000. Good openings for any industries. Number of buildings erected, 9; cost $21,000. Amount expended on permanent improvements, $7,500. Joseph White, Town Clerk, Whitby.

Whitby, E., Tp.—Number of buildings erected, 6; cost $5,000. Amount expended on permanent improvements, $4,000. William Purves, Township Clerk, Columbus.

Whitby, Tp.—Number of buildings erected, 6; cost $10,000. Amount expended on permanent improvements, $2,000. D. Holliday, Township Clerk, Brooklin.

Whitchurch, Tp.—One new building erected; cost $4,300. Amount expended on permanent improvements, $2,504. J. C. Lundy, Township Clerk, Newmarket.

Wiarton, Tn.—Wooden frames for bed springs factory started. Owns and operates waterworks; cost $50,084. Good openings for industries of any character. Number of buildings erected, 5; cost $25,000. Amount expended on permanent improvements, $443. Amount expended on sanitation, $1,234. R. W. Bright, Town Clerk, Wiarton.

Wicklow, Tp.—See Bangor, Wicklow and McClure Tps.

Wildifield, Tp.—Number of buildings erected, 12; cost $4,800. Amount expended on permanent improvements, $472. John A. Carmichael, Township Clerk, North Bay.

Wilberforce and North Algona, Tp.—Good opening for cement factory. Amount expended on permanent improvements, $600. Thomas McKibbon, Township Clerk, Eganville.

Williams, E., Tp.—Number of buildings erected, 7; cost $6,000. Amount expended on permanent improvements, $2,000. D. A. Stewart, Township Clerk, Ailsa Craig.

Williamsburg, Tp.—Good opening for sash and door factory and apple barrel factory. Number of buildings erected, 6; cost, $8,000. Amount expended on permanent improvements, $5,125. Amount expended on sanitation, $20. George Lane, Township Clerk, Williamsburg.

Willoughby, Tp.—No new buildings erected. Amount expended on permanent improvements, $1,500. J. A. Plyley, Township Clerk, Chippawa.

Wilmot, Tp.—The police village of Baden in this township owns and operates hydro-electric lighting and power plant; cost . Good opening for foundry. Amount expended on permanent improvements, $4,923. Amount expended on sanitation, $255. F. Holwell, Township Clerk, Baden.

Winchester, Tp.—Number of buildings erected, 15; cost, $70,000. Amount expended on permanent improvements, $5,963. George Elliott, Township Clerk, Morewood.

Winchester, V.—Good opening for creamery. No new buildings erected. Amount expended on permanent improvements, $100. Hugh McMaster, Village Clerk, Winchester.

Windham, Tp.—Number of buildings erected 21; cost, $9,170. Amount expended on permanent improvements, $2,000. Amount expended on sanitation, $100. J. T. Camfield, Township Clerk, Windham Centre.

Windsor, C.—Blanket factory, spring wire factory, etc., started. Owns and operates waterworks, cost $275,000; electric light plant, cost $30,000. Good openings for boot and shoe factory, pork packing factory, carriage factory, knitting factory, canning factory. Number of buildings erected, 300; cost, $3,161,225. Amount expended on permanent improvements, $62,349. Amount expended on sanitation, $19,307. Stephen Lusted, City Clerk, Windsor.

Wingham, Tn.—Owns and operates waterworks system, cost $41,500; electric

light plant, cost $37,000. Good openings for boot and shoe factory, knitting factory and ready-made clothing. Number of buildings erected, 3; cost, $3,000. Amount expended on permanent improvements, $1,373. Amount expended on sanitation, $4,870. John E. Groves, Town Clerk, Wingham.

Wolfe Island, Tp.—Owns and operates steam ferry, cost $20,000 Good opening for canning factory. No new buildings erected. Amount expended on permanent improvements, $300. D. J. Dawson, Township Clerk, Kingston.

Wolford, Tp.—Number of buildings erected, 4; cost, $3,000. Amount expended on permanent improvements, $450. Geo. W. Harris, Township Clerk, Jasper.

Wollaston, Tp.—Good openings for mining, stave and heading factory, and lath and shingle mill. Number of buildings erected, 3; cost $1,000. Amount expended on permanent improvements, $1,150. Amount expended on sanitation, $50. Alex. Miller, Township Clerk, Coe Hill.

Wood, Tp.—See Medora and Wood Tps.

Woodbridge, V.—Owns and operates street lights; cost $100. Good opening for foundry or machine shop. One new building erected, cost $1,500. Amount expended on permanent improvements, $3,900. Edward Brown, Village Clerk, Woodbridge.

Woodhouse, Tp.—Broom making and alfalfa grinding started. Good opening for cement, brick and tile factory. Number of buildings erected, 50; cost $75,000. Amount expended on permanent improvements, $6,200. Amount expended on sanitation, $60. Frank Bowlby, Township Clerk, Simcoe.

Woodstock, C.—Knitting factory and automobile works started. Owns and operates waterworks, cost $218,278; electric light and power plant, cost $100,219. Good opening for iron working and other industries. Number of buildings erected, 20; cost $200,000. Amount expended on permanent improvements, $5,000. Amount expended on sanitation, $1,500. John Morrison, City Clerk, Woodstock.

Woodville, V.—Planing mill, sash and door factory and cotton factory started. No new buildings erected. Amount expended on permanent improvements, $50. A. E. Staback, Village Clerk, Woodville.

Woolwich, Tp.—Number of buildings erected, 7; cost $10,000. Amount expended on permanent improvements, $4,810. W. J. Snider, Township Clerk, Conestogo.

Worthington, and Blue, Tps.—Number of buildings erected, 7; cost $2,800. Amount expended on permanent improvements, $3,291. E. Engebretson, Township Clerk, Sleeman.

Wroxeter, V.—Owns and operates electric light plant, cost $1,900. Good opening for evaporator and furniture factory. No new buildings erected. Amount expended on permanent improvements, $4,600. J. Brethauer, Village Clerk, Wroxeter.

Wylie, Tp.—See Rolph, Buchanan, and Wylie Tps.

Wyoming, V.—Good openings for canning factory, basket factory, barrel factory, butter factory and foundry and agricultural repair shop. Number of buildings erected, 3; cost $3,700. Amount expended on permanent improvements. $1,300. H. G. Taylor, Village Clerk, Wyoming.

Yarmouth, Tp.—Number of buildings erected, 19; cost $22,500. Amount expended on permanent improvements, $11,896. Amount expended on sanitation, $340. W. C. Caughell, Township Clerk, St. Thomas.

YONGE, FRONT, Tp.—No new buildings erected. Amount expended on permanent improvements, $1,487. Amount expended on sanitation, $77. F. H. Mallory, Township Clerk, Mallorytown.

YONGE, and ESCOTT, Rear, Tps.—Good opening for cheese box factory. Number of buildings erected, 3; cost $3,000. Amount expended on permanent improvements, $568. R. E. Cornell, Township Clerk, Athens.

YORK, Tp.—Number of buildings erected, 300; cost $180,000. Amount expended on permanent improvements, $41,473. Amount expended on sanitation, $1,473. W. A. Clarke, Township Clerk, 40 Jarvis Street, Toronto.

ZONE, Tp.—Number of buildings erected, 2; cost $1,800. Amount expended on permanent improvements, $1,500. Amount expended on sanitation, $16. Henry Osborne, Township Clerk, Dante.

ZORRA, E., Tp.—Number of buildings erected, 53; cost $32,000. Amount expended on permanent improvements, $9,000. Amount expended on sanitation, $150. James Anderson, Township Clerk, Woodstock.

ZORRA, W., Tp.—Number of buildings erected, 14; cost $7,000. Amount expended on permanent improvements, $3,700. Amount expended on sanitation, $1,106. Allan Murray, Township Clerk, Embro.

STATISTICS TABULATED.

The preceding returns by the municipal clerks, as far as statistics are concerned, have been tabulated as follows, thus giving a clear view of the expenditure on new buildings, permanent improvements and sanitation. The additional column, introduced four years ago, has been repeated, showing the public utilities owned and operated by the municipalities, with the capital thus invested, the continuous increase having been most satisfactory.

MUNICIPAL STATISTICS.

C., city; Tn., town; V., village; Tp., township.

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Acton, V.	10	1,000	1,700	.....	10,050
Adelaide, Tp.	30	15,000	7,000	.....	.....
Adjala, Tp.	4	5,500	1,828	.....	.....
Admaston, Tp.	5	3,500	748	.....	.....
Adolphustown, Tp.	.....	.....	210	.....	.....
Ailsa Craig, V.	1	2,500	500	120	.....
Albemarle, Tp.	.....	.....	1,900	.....	1,000
Alberton and Roddick, Tps.	3	2,500	2,500	.....	.....
Albion, Tp.	10	6,000	5,000	.....	.....
Aldborough, Tp.	20	20,000	5,000	.....	.....
Alexandria, Tn.	10	15,000	5,572	150	47,500
Alfred, Tp.	20	10,000	1,885	.....	.....
Algona, S., Tp.	.....	.....	.....	.....	.....
Algona, N., Tp.	1	125	10	16	.....
Alice and Fraser, Tps.	19	4,100	317	.....	.....
Alliston, Tn.	4	6,000	3,000	200	20,000
Almonte, Tn.	4	30,000	4,000	200	40,000
Alnwick, Tp.	3	1,400	500	.....	.....
Alvinston, V.	2	2,500	.....	255	.....
Amabel, Tp.	3	1,000	2,500	.....	.....
Amaranth, Tp.	.....	.....	3,500	.....	.....
Ameliasburg, Tp.	6	6,000	1,393	37	.....
Amherst Island, Tp.	.....	.....	200	.....	.....
Amherstburg, Tn.	8	50,000	1,000	800	44,500
Ancaster, Tp.	30	25,000	3,597	142	.....
Anderdon, Tp.	4	4,800	1,959	.....	.....
Anglesea, Tp.	.....	.....	.....	.....	.....
Anson and Hindon, Tps.	.....	.....	700	.....	.....
Anstruther, Tp.	.....	.....	.....	.....	.....
Arkona, V.	.....	.....	.....	75	.....
Armour, Tp.	3	1,800	1,332	16	.....
Arnprior, Tn.	11	35,000	2,260	2,833	118,300
Arran, Tp.	5	5,000	4,651	66	.....
Artemesia, Tp.	13	15,000	2,687	10	.....
Arthur, Tp.	6	7,000	3,500	.....	.....
Arthur, V.	.....	.....	2,000	30	.....
Ashfield, Tp.	.....	.....	3,107	16	.....
Asphodel, Tp.	2	3,000	1,500	.....	.....
Assiginack, Tp.	3	900	2,563	7	.....
Athens, V.	1	2,000	.....	.....	.....
Athol, Tp.	5	8,000	1,700	.....	.....
Atwood, Tp.	3	1,800	1,100	.....	.....
Augusta, Tp.	8	6,600	5,000	.....	.....
Aurora, Tn.	30	50,000	6,000	300	35,000

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings, erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No	$	$	$	$
Aylmer, Tn.	8	17,000	13,000	.....	135,000
Ayr, V.	1	3,500	3,572	.....	.....
Bagot and Blythfield, Tps.	3	3,500	.....	.....	.....
Balfour, Tp.	.....	.....	505	.....	.....
Bancroft, V.	.....	.....	500	.....	.....
Bangor, Wicklow, &c., Tps.	10	5,000	500	.....	.....
Barrie, Tn.	21	4,800	7,700	8,475	209,064
Barrie, Tp.	.....	.....	151	.....	.....
Barton, Tp.	50	50,000	9,582	292	.....
Bastard and Burgess, Tps.	.....	.....	1,660	69	.....
Bath, V.	4	4,000	380	10	225
Bathurst, Tp.	24	15,000	397	32	.....
Bayfield, V.	1	3,000	659	.....	.....
Bayham, Tp.	.....	.....	8,000	.....	.....
Beamsville, V.	8	17,000	200	.....	27,000
Beaverton, V.	2	3,500	647	27	.....
Beckwith, Tp.	.....	.....	1,254	12	.....
Bedford, Tp.	6	6,000	1,360	.....	.....
Beeton, V.	2	4,000	1,000	.....	24,000
Belle River, V.	2	2,600	500	.....	.....
Belmont and Methuen, Tps.	5	5,500	1,986	.....	.....
Belleville, C.	65	300,000	64,000	70,000	282,000
Bentinck, Tp.	14	19,000	1,000	.....	.....
Berlin, C.	197	364,693	65,062	16,204	794,544
Bertie, Tp.	25	30,000	4,974	291	.....
Beverly, Tp.	6	7,100	2,496	.....	.....
Bexley, Tp.	1	475	1,300	.....	.....
Biddulph, Tp.	.....	.....	7,024	251	.....
Billings, Tp.	.....	.....	1,500	.....	.....
Binbrook, Tp.	10	6,000	2,183	.....	.....
Blandford, Tp.	2	7,000	1,791	81	.....
Blanshard, Tp.	11	15,000	7,000	.....	.....
Blenheim, Tn.	2	6,000	.....	.....	12,500
Blenheim, Tp.	11	13,500	7,212	.....	.....
Blezard, Tp.	2	900	71	.....	.....
Blind River, Tn.	6	5,000	1,210	.....	.....
Bloomfield, V.	.....	.....	3,000	.....	.....
Blyth, V.	2	3,500	300	.....	8,000
Bobcaygeon, V.	3	4,000	750	.....	25,000
Bolton, V.	3	7,000	500	75	.....
Bonfield, Tn.	3	1,600	133	6	.....
Bonfield, Tp.	10	4,000	476	10	.....
Bosanquet, Tp.	.....	.....	4,409	.....	.....
Bothwell, Tn.	3	9,000	.....	.....	10,500
Bowmanville, Tn.	3	45,000	2,700	400	.....
Bracebridge, Tn.	4	3,000	5,916	105	163,000
Bradford, Tn.	1	2,000	650	.....	.....
Brampton, Tn.	30	50,000	16,500	1,300	125,000
Brant, Tp.	10	11,000	8,000	.....	.....
Brantford, C.	531	613,860	80,163	67,671	512,311
Brantford, Tp.	130	195,000	1,300	.....	.....
Bridgeburg, Tn.	10	20,000	2,300	20,659	52,000
Brighton, Tp.	3	3,000	2,100	.....	.....
Brighton, V.	5	10,000	2,000	500	.....
Brock, Tp.	6	16,000	9,430	240	.....
Brockville, Tn.	30	157,900	8,279	1,264	479,218

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Bromley, Tp.	3	3,000	5,000	.....	.....
Brooke, Tp.	10	20,000	5,414	27	.....
Brougham, Tp.	.....	.....	150	.....	.....
Bruce, Tp.	24	11,500	5,082	.....	.....
Bruce Mines, Tn	.....	.....	494	.....	.....
Brudenell and Lynedoch, Tps.	4	600	40	.....	.....
Brunel, Tp.	3	1,000	1,100	.....	.....
Brussels, V.	1	3,500	109	.....	.....
Bucke, Tp.	.....	.....	.....	.....	.....
Burford, Tp.	20	20,000	7,000	.....	.....
Burgess N., Tp.	10	1,000	150	.....	.....
Burk's Falls, V.	5	6,400	1,130	.....	37,000
Burleigh and Anstruther, Tps.	5	1,550	71	.....	.....
Burlington, V.	27	48,000	13,400	1,996	60,000
Burpee, Tp.	.....	.....	300	.....	.....
Cache Bay, Tn.	3	2,000	699	45	.....
Calstor, Tp.	15	10,000	2,500	.....	.....
Caldwell, Tp.	4	4,500	4,000	.....	.....
Caledon, Tp.	6	11,000	3,000	.....	.....
Caledonia, Tp.	5	10,000	1,000	150	.....
Caledonia, V.	12	25,000	2,300	200	.....
Cambridge, Tp.	.....	.....	3,290	.....	.....
Camden, Tp.	10	10,000	2,500	.....	.....
Camden E., Tp.	7	14,000	3,000	.....	.....
Cameron, Tp.	3	1,800	1,500	.....	.....
Campbellford, Tn.	50	50,000	5,000	30,000	160,000
Canboro, Tp.	.....	.....	665	10	.....
Cannington, V.	1	9,000	1,325	3,360	.....
Caradoc, Tp.	.....	.....	15,000	.....	.....
Carden, Tp.	3	3,000	476	.....	.....
Cardiff, Tp.	4	1,600	86	.....	.....
Cardinal, V.	3	10,000	800	.....	.....
Cardwell, Tp.	3	5,000	635	.....	.....
Carleton Place, Tn.	9	40,000	4,791	.....	.....
Carling, Tp.	3	1,235	.....	.....	.....
Carlow, Tp.	2	2,200	650	7	.....
Carnarvon, Tp.	.....	.....	.....	.....	.....
Carrick, Tp.	20	26,000	3,000	69	.....
Cartwright, Tp.	10	7,700	1,285	96	.....
Casey, Tp.	5	665	1,993	.....	.....
Casselman, V.	6	3,000	657	186	5,000
Cassimir, Jennings, &c., Tps.	10	3,000	750	.....	.....
Cavan, Tp.	8	3,700	6,749	29	.....
Cayuga, V.	2	8,000	.....	.....	.....
Cayuga N., Tp.	8	10,000	625	.....	.....
Cayuga S., Tp.	2	2,500	350	.....	.....
Chaffey, Tp.	6	3,000	1,500	.....	.....
Chamberlain, Tp.	.....	.....	2,891	.....	.....
Chandos, Tp.	4	600	165	112	.....
Chapleau, Tp.	6	31,000	7,528	.....	40,094
Chapman, Tp.	5	2,500	2,005	5	.....
Chapple, Tp.	4	3,000	4,918	509	.....
Charlottenburg, Tp.	10	20,000	.....	.....	.....
Charlotteville, Tp.	.....	.....	1,850	37	.....
Chatham, C.	84	355,147	26,979	6,573	248,500
Chatham, Tp.	12	80,000	1,500	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Chatsworth, V.	.....	.....	102	6	.....
Chelmsford, Tn.	5	2,000	400	.....	.....
Chesley, Tn.	.....	.....	762	300	42,320
Chesterville, V.	.....	.....	.....	500	.....
Chinguacousy, Tp.	7	11,100	15,000	.....	30,000
Chippawa, V.	4	5,800	1,000	.....	600
Christie, Tp.	4	2,000	500	.....	.....
Clarence, Tp.	200	36,000	3,850	600	.....
Clarendon and Miller Tps.	2	700	600	.....	.....
Clarke, Tp.	20	25,000	3,899	125	.....
Clifford, V.	1	2,500	276	.....	3,000
Clinton, Tn.	2	4,000	8,000	.....	59,000
Clinton, Tp.	12	22,800	4,682	.....	.....
Cobalt, Tn.	26	20,000	7,016	7,781	110,000
Cobden, V.	.....	.....	3,026	.....	.....
Cobourg, Tn.	46	138,500	4,343	2,199	.....
Cochrane, Tn.	215	268,600	12,000	.....	54,000
Cockburn Island, Tp.	1	500	483	.....	.....
Colborne, Tp.	.....	.....	2,142	.....	.....
Colborne, V.	1	4,000	1,125	12	.....
Colchester N., Tp.	15	12,000	3,891	35	10,154
Colchester S., Tp.	.....	20,000	2,489	.....	.....
Coldwater, V.	2	25,000	.....	.....	23,000
Coleman, Tp.	.....	.....	47,668	145	.....
Collingwood, Tn.	20	68,450	8,000	5,000	121,400
Collingwood, Tp.	11	8,000	5,123	.....	7,000
Copper Cliff, Tn.	12	22,000	802	1,842	.....
Cornwall, Tn.	9	34,600	9,235	769	142,632
Cornwall, Tp.	20	21,000	6,000	.....	.....
Courtright, V.	1	500	852	.....	.....
Cramahe, Tp.	.....	.....	4,650	26	.....
Creemore, V.	3	4,000	500	.....	20,000
Crosby N., Tp.	4	2,000	541	.....	.....
Crosby South, Tp.	6	3,000	2,000	.....	.....
Crowland, Tp.	33	120,000	1,800	937	.....
Culross, Tp.	3	1,500	2,000	40	.....
Cumberland, Tp.	19	10,000	1,200	.....	.....
Dack, Tp.	9	6,400	1,477	102	.....
Dalhousie and N. Sherbrooke Tps.	8	5,000	.....	.....	.....
Dalton, Tp.	3	2,000	300	.....	.....
Darling, Tp.	.....	.....	192	6	.....
Darlington, Tp.	10	10,000	6,000	20	.....
Dawn, Tp.	20	15,000	3,000	.....	10,000
Day and Bright Add., Tps.	6	4,000	400	.....	.....
Delaware, Tp.	5	4,000	4,410	66	.....
Delhi, V.	.....	.....	2,540	.....	.....
Denbigh, Abinger, &c., Tps.	6	1,800	266	.....	.....
Derby, Tp.	.....	.....	4,333	65	.....
Dereham, Tp.	.....	.....	7,000	100	.....
Deseronto, Tn.	1	500	823	875	85,000
Dilke, Tp.	2	2,000	1,279	.....	.....
Dorchester N., Tp.,	.....	.....	4,000	.....	.....
Dorchester S., Tp.	9	10,000	4,000	.....	.....
Douro, Tp.	7	5,000	2,000	.....	.....
Dover, Tp.	10	11,600	10,000	9,000	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No	$	$	$	$
Downie, Tp.	10	16,800	7,500	108	.....
Draper, Tp.	.....	.....	1,800	.....	.....
Drayton, V.	7	7,100	500	50	.....
Dresden, Tn.	5	7,700	3,241	400	30,000
Drummond, Tp.	15	3,000	755	27	.....
Drury, Denison &c., Tps.	5	2,000	2,417	853	226
Dryden, Tn.	9	17,000	1,800	250	.....
Dumfries, N., Tp.	7	5,100	7,443	.....	.....
Dumfries, S., Tp.	6	13,000	3,317	124	.....
Dummer, Tp.	14	15,000	1,785	16	.....
Dundalk, V.	2	1,000	500	100	8,000
Dundas, Tn.	25	45,000	.....	130	79,670
Dungannon, Tp.	3	1,300	1,000	175	.....
Dunn, Tp.	3	2,000	150	10	.....
Dunnville, Tn.	19	50,000	3,000	.....	31,000
Dunwich, Tp.	1	1,000	3,500	.....	.....
Durham, Tn.	10	32,610	.....	.....	.....
Dutton, V.	3	4,000	750	40	.....
Dymond, Tp.	.....	.....	2,923	5	.....
Dysart, &c., Tps.	40	30,000	3,000	100	400
Easthope, N., Tp.	24	15,000	2,000	.....	.....
Easthope, S., Tp.	3	3,000	1,799	.....	.....
Eastnor, Tp.	2	2,000	1,366	98	.....
Eastview, V.	115	30,000	2,407	.....	.....
Edwardsburgh, Tp.	15	15,000	1,700	46	.....
Egansville, V.	30	100,000	.....	.....	.....
Egremont, Tp.	3	3,000	3,000	.....	.....
Ekfrid, Tp.	4	9,500	5,057	.....	.....
Elderslie, Tp.	12	20,000	4,748	26	.....
Eldon, Tp.	6	7,000	4,500	.....	.....
Elizabethtown, Tp.	.....	.....	.....	.....	.....
Ellice, Tp.	28	21,000	3,309	172	.....
Elma, Tp.	12	15,000	4,250	120	.....
Elmira, V.	23	25,000	2,000	.....	35,000
Elmsley, N., Tp.	1	500	340	56	.....
Elmsley, S., Tp.	4	2,000	164	.....	.....
Elora, V.	3	6,000	800	.....	.....
Elzevir, Tp.	5	4,000	1,078	.....	.....
Embro, V.	.....	.....	250	.....	.....
Emily, Tp.	15	11,000	2,361	.....	.....
Emo, Tp.	6	4,500	4,929	.....	.....
Englehart, Tn.	4	3,525	589	326	.....
Enniskillen, Tp.	6	5,500	7,000	14	.....
Ennismore, Tp.	8	3,000	2,000	.....	.....
Eramosa, Tp.	14	18,000	3,337	210	.....
Erin, Tp.	.....	.....	700	.....	.....
Erin, V.	.....	.....	1,000	.....	.....
Ernestown, Tp.	6	3,000	2,174	.....	.....
Escott Front, Tp.	5	3,200	1,740	18	.....
Esquesing, Tp.	15	15,000	.....	.....	.....
Essa, Tp.	6	5,500	1,726	200	.....
Essex, Tn.	8	8,100	.....	130	33,000
Etobicoke, Tp.	37	112,000	6,500	1,100	.....
Euphemia, Tp.	2	2,200	2,891	.....	.....
Euphrasia, Tp.	.....	.....	3,084	.....	.....
Exeter, V.	5	9,000	.....	.....	22,000

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Faraday, Tp.	.....	.....	400	.....	.....
Fenelon, Tp.	12	12,000	2,200	.....	.....
Fenelon Falls, V.	3	8,000	1,000	.....	75,000
Fergus, V.	13	70,000	9,439	150	35,000
Ferris, Tp.	5	1,500	500	.....	.....
Finch, Tp.	6	3,000	4,070	.....	.....
Finch, V.	.....	.....	31	.....	.....
Fitzroy, Tp.	.....	9,000	2,600	.....	.....
Flamboro, E., Tp.	8	95,000	5,100	.....	.....
Flamboro, W., Tp.	4	2,050	1,400	130	.....
Flos, Tp.	6	9,000	1,200	.....	.....
Foley, Tp.	4	2,500	1,005	30	.....
Forest, Tn.	5	48,600	1,250	35	.....
Fort Erie V.	15	15,000	1,000	.....	59,000
Fort Frances, Tn.	18	16,500	1,666	608	99,257
Fort William, C.	479	3,077,860	205,829	148,562	1,792,799
Fredericksburg N., Tp.	1	3,000	1,241	58	.....
Fredericksburg, S., Tp.	13	11,360	512	.....	.....
Fullarton, Tp.	4	2,000	2,600	.....	.....
Gainsborough, Tp.	16	16,200	1,630	89	.....
Galt, Tn.	200	282,334	6,563	15,712	322,943
Galway & Cavendish, Tps.	.....	.....	350	.....	.....
Gananoque, Tn.	5	41,500	4,365	.....	260,000
Garafraxa, E., Tp.	.....	.....	2,350	66	.....
Garafraxa, W., Tp.	3	7,000	1,000	.....	.....
Garden Island, Tp.	.....	.....	155	.....	.....
Georgetown, V.	50	85,000	4,500	100	43,000
Georgina, Tp.	5	7,000	1,330	.....	.....
Glamorgan, Tp.	.....	.....	3,000	.....	.....
Glanford, Tp.	10	10,000	1,432	35	.....
Glencoe, V.	4	1,900	391	102	12,000
Glenelg, Tp.	3	4,000	2,300	42	.....
Gloucester, Tp.	.....	.....	3,989	.....	5,000
Goderich, Tn.	25	49,300	4,304	9,983	131,674
Goderich, Tp.	10	10,300	2,200	.....	11,000
Gordon, Tp.	5	3,700	1,800	.....	.....
Gore Bay, Tn.	2	5,000	1,500	.....	.....
Gosfield, N., Tp.	10	10,000	2,172	25	15,125
Gosfield, S., Tp.	32	13,500	5,164	.....	.....
Goulburn, Tp.	8	4,500	5,107	28	.....
Gower, N., Tp.	3	9,000	2,000	106	.....
Gower, S., Tp.	.....	.....	546	43	.....
Grand Valley, V.	4	20,000	1,700	21	.....
Grantham, Tp.	22	50,000	2,950	.....	.....
Grattan, Tp.	5	4,500	716	.....	.....
Gravenhurst, Tn.	3	1,800	3,300	.....	125,000
Greenock, Tp.	.....	.....	3,606	83	.....
Grey, Tp.	5	6,000	2,730	.....	.....
Griffith and Matawatchan, Tps.	.....	.....	213	.....	.....
Grimsby, V.	.....	.....	.....	.....	.....
Grimsby, N., Tp.	10	20,000	5,237	100	.....
Grimsby, S., Tp.	5	4,800	800	.....	.....
Guelph, C.	106	513,690	31,250	19,116	912,791
Guelph, Tp.	.....	.....	3,954	.....	.....
Gwillimbury, E., Tp.	7	5,000	3,300	.....	.....
Gwillimbury, N., Tp.	.....	.....	2,378	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
		$	$	$	$
Gwillimbury, W., Tp.	.....	.....	1,150	.....	.....
Hagar, Tp.	5	1,060	74	.....	.....
Hagarty and Richards, Tps.	.....	.....	550	.....	.....
Hagerman, Tp.	6	2,500	550	.....	.....
Hagersville, V.	8	13,000	1,750	300	.....
Haileybury, Tn.	30	150,000	4,357	27,914	101,095
Haldimand, Tp.	50	40,000	4,800	74	.....
Hallam, Tp.	1	500	600	.....	.....
Hallowell, Tp.	3	3,100	931	.....	.....
Hamilton, C.	1,887	4,173,105	52,800	255,000	2,760,000
Hamilton, Tp.	10	10,000	4,049	88	.....
Hanmer, Tp.	7	8,300	700	.....	.....
Hanover, Tn.	49	78,000	.....	47	31,000
Harley, Tp.	6	1,200	2,333	.....	.....
Harris, Tp.	10	850	1,427	.....	.....
Harriston, Tn.	4	14,000	600	.....	35,000
Harvey, Tp.	3	3,000	800	.....	1,500
Harwich, Tp.	6	65,000	11,600	104	.....
Hastings, V.	4	1,200	6,000	.....	.....
Havelock, V.	4	7,200	9,000	60	.....
Hawkesbury, Tn.	5	10,000	903	12	110,000
Hawkesbury, E., Tp.	10	12,000	2,000	.....	.....
Hawkesbury, W., Tp.	15	15,000	2,000	100	.....
Hay, Tp.	.....	.....	5,565	.....	.....
Head, Clara and Maria, Tps.	4	1,000	600	.....	.....
Hensall, V.	3	10,000	3,000	.....	.....
Hepworth, V.	.....	.....	246	.....	.....
Hespeler, Tn.	20	30,000	5,000	.....	28,000
Hibbert, Tp.	.....	.....	.....	.....	.....
Hilliard, Tp.	25	1,505	2,472	.....	.....
Hillier, Tp.	.....	3,000	500	.....	.....
Hilton, Tp.	3	1,000	1,173	.....	.....
Himsworth, N., Tp.	4	3,000	1,330	.....	.....
Himsworth, S., Tp.	.....	.....	2,666	.....	.....
Hinchinbrooke, Tp.	10	5,000	825	.....	.....
Holland Landing, V.	.....	.....	300	.....	.....
Hope, Tp.	12	15,700	2,900	.....	.....
Horton, Tp.	.....	.....	1,500	.....	.....
Houghton Tp.	2	1,750	1,396	.....	.....
Howard, Tp.	.....	.....	4,000	.....	.....
Howe Island, Tp.	4	800	25	.....	.....
Howick, Tp.	.....	.....	7,840	85	.....
Howland, Tp.	2	1,500	1,450	.....	.....
Hudson, Tp.	6	3,000	2,200	.....	.....
Hullett, Tp.	7	5,000	6,500	.....	.....
Humberston, Tp.	15	20,000	6,145	42	.....
Humphrey, Tp.	.....	.....	600	.....	.....
Hungerford, Tp.	15	30,000	900	.....	.....
Huntingdon, Tp.	6	8,000	2,500	.....	.....
Huntley, Tp.	.....	.....	4,655	.....	.....
Huntsville, Tn.	.....	.....	2,000	.....	40,000
Huron, Tp.	7	10,000	5,853	35	.....
Ignace, Tp.	7	14,000	400	.....	.....
Ingersoll, Tn.	15	60,000	6,000	.....	205,000
Innisfil, Tp.	6	10,000	2,353	111	.....
Iroquois, V.	.....	.....	520	.....	40,000

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Jaffray and Melick, Tps.	.....	.....	800	.....	.....
James, Tp.	5	6,000	1,065	200	.....
Jarvis, V.	6	10,500	900	.....	.....
Jocelyn, Tp.	.....	.....	1,839	.....	.....
Johnson, Tp.	.....	.....	1,674	.....	.....
Joly, Tp.	.....	.....	900	.....	.....
Kaladar, Anglesea, &c., Tps.	3	2,500	579	64	.....
Kearney, Tn.	4	23,000	250	50	700
Keewatin, Tn.	2	2,000	2,130	.....	.....
Kemptville, V.	.....	.....	1,300	.....	.....
Kennebec, Tp.	.....	.....	300	.....	.....
Kenora, Tn.	3	10,000	4,879	1,401	781,121
Keppel, Tp.	10	16,000	500	.....	.....
Kerns, Tp.	.....	.....	1,971	.....	.....
Kincardine, Tn.	3	2,500	3,649	.....	68,303
Kincardine, Tp.	.....	.....	.....	.....	.....
Killaloe Stn., V.	.....	.....	200	80	.....
King, Tp.	32	27,200	7,200	420	1,800
Kingston, C.	52	151,230	12,059	1,266	705,855
Kingston, Tp.	.....	12,000	2,000	.....	.....
Kingsville, Tn.	4	13,000	4,500	.....	35,000
Kinloss, Tp.	5	10,200	1,863	.....	.....
Kitley, Tp.	4	5,000	2,000	.....	.....
Korah and Parke, Tps.	11	3,150	4,200	.....	.....
Lakefield, V.	2	4,000	3,500	.....	.....
Lanark, Tp.	5	6,000	1,000	.....	.....
Lanark, V.	.....	.....	6,600	.....	.....
Lancaster, Tp.	16	12,000	2,859	.....	.....
Lancaster, V.	.....	.....	1,000	10	.....
Latchford, Tn.	.....	.....	109	.....	.....
Lavelle Tp.	5	3,285	7,243	.....	.....
Lavant, Tp.	.....	.....	204	.....	.....
Laxton, Digby &c., Tps.	10	4,000	1,250	.....	.....
Leamington, Tn.	18	23,000	5,565	100	51,000
Leeds & Lansdowne, Front, Tps.	16	30,000	7,209	79	.....
Leeds & Lansdowne, Rear, Tps.	8	8,000	1,700	.....	.....
Limerick, Tp.	2	350	798	.....	.....
Lindsay, Tn.	22	75,000	3,500	2,000	125,000
Lindsay, Tp.	4	1,400	1,200	30	.....
Listowel, Tn.	1	700	1,522	581	46,000
Little Current, Tn.	15	40,000	.....	.....	.....
Lobo, Tp.	12	12,500	7,160	.....	.....
Lochiel, Tp.	.....	.....	3,000	.....	.....
Logan, Tp.	5	12,000	5,385	4,713	.....
London, C.	1,039	1,036 880	1,123,434	517,638	2,123,404
London, Tp.	100	100,000	28,505	478	.....
Longueuil, Tp.	7	2,000	1,000	.....	.....
L'Orignal, V.	.....	10,000	3,000	.....	.....
Loughborough, Tp.	.....	.....	2,312	.....	.....
Lucan, V.	.....	5,000	.....	.....	5,000
Lucknow, V.	1	300	33	.....	10,000
Luther, E. Tp.	6	6,000	2,492	29	.....
Luther, W., Tp.	3	3,000	1,871	58	.....
Lutterworth, Tp.	6	2,000	500	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
McDougall, Tp.	2	1,000	909	40	.....
McGillivray, Tp.	3	4,200	3,890	.....	.....
McIrvine, Tp.	.....	.....	360	.....	.....
McKellar, Tp.	3	1,200	311	2	.....
McKillop, Tp.	5	6,500	3,455	.....	.....
McKim, Tp.	.....	.....	.....	.....	.....
McLean and Ridout, Tps.	6	1,500	120	.....	.....
McMurrich, Tp.	4	1,275	700	.....	.....
McNab, Tp.	7	6,000	1,000	.....	.....
Macaulay, Tp.	1	30	.....	.....	.....
Macdonald, Meredith, &c., Tps.	7	5,000	1,950	60	.....
Machar, Tp.	2	1,000	300	.....	.....
Machin, Tp.	9	2,520	1,200	.....	.....
Madoc, Tp.	20	25,000	1,200	200	.....
Madoc, V.	4	6,000	1,610	70	15,000
Maidstone, Tp.	20	17,000	8,682	97	12,605
Malahide, Tp.	11	8,000	6,338	200	.....
Malden, Tp.	13	12,100	.....	.....	.....
Manvers, Tp.	7	4,300	2,153	94	.....
Mara, Tp.	.....	.....	5,000	.....	.....
March, Tp.	2	2,000	2,600	.....	.....
Mariposa, Tp.	8	17,000	6,960	143	.....
Markdale, V.	10	9,000	365	.....	30,000
Markham, Tp.	.....	.....	6,997	.....	.....
Markham, V.	2	5,000	400	.....	15,000
Marlborough, Tp	2	1,200	403	.....	.....
Marmora and Lake, Tps.	6	3,000	1,500	.....	.....
Marmora, V.	8	5,000	500	.....	5,000
Martland, Tp.	6	2,400	1,300	.....	.....
Maryborough, Tp.	.....	.....	3,642	46	.....
Marysburgh, N., Tp.	9	5,400	800	.....	.....
Marysburgh, S., Tp.	15	10,000	3,000	.....	.....
Massey, Tn.	.....	.....	37	.....	22,670
Matchedash, Tp.	1	4,000	600	.....	.....
Matilda, Tp.	3	3,000	4,500	.....	.....
Mattawa, Tn.	.....	.....	164	443	.....
Mattawan, Tp.	7	1,000	.....	.....	.....
Maxville, V.	4	30,000	.....	.....	.....
Mayo, Tp.	.....	.....	800	.....	.....
Meaford, Tn.	50	60,000	5,000	1,000	30,000
Medonte, Tp.	28	25,000	6,500	.....	20,000
Medora and Wood, Tps.	7	8,000	3,741	225	.....
Melancthon, Tp.	35	27,000	7,000	50	.....
Merrickville, V.	2	2,400	2,600	.....	.....
Merritton, V.	26	65,000	2,716	2,074	98,181
Mersea, Tp.	25	35,000	4,000	150	.....
Metcalfe, Tp.	7	5,200	3,200	65	.....
Middleton, Tp.	.....	.....	3,147	.....	.....
Midland, Tn.	40	75,000	8,000	500	144,000
Millbrook, V.	2	5,000	15,000	200	.....
Milton, Tn.	30	30,000	13,000	.....	50,500
Milverton, V.	4	13,000	3,000	.....	.....
Mimico, V.	50	50,000	2,000	100	13,000
Minden, Tp.	5	1,000	540	75	.....
Minto, Tp.	9	10,600	4,000	.....	.....
Mitchell, Tn.	.....	.....	689	.....	35,000
Monaghan N., Tp.	20	30,000	3,000	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Monaghan S., Tp.	3	6,000	1,600	.....	.....
Monck, Tp.	26	28,950	1,673	.....	.....
Monmouth, Tp.	5	3,000	200	.....	.....
Mono, Tp.	7	6,000	13,000	.....	.....
Monteagle and Herschel, Tps.	7	4,700	1,200	.....	.....
Moore, Tp.	25	15,000	4,000	.....	.....
Morley, Tp.	6	4,000	2,500	.....	.....
Mornington, Tp.	6	7,700	3,066	.....	.....
Morris, Tp.	4	7,500	4,650	25	8,000
Morrisburg, V.	.....	.....	1,817	.....	65,000
Morrison, Tp.	7	7,700	300	.....	.....
Mosa, Tp.	.....	.....	4,069	10	.....
Moulton, Tp.	10	10,000	700	50	.....
Mount Forest, Tn.	3	22,000	.....	.....	45,000
Mountain, Tp.	4	10,000	2,654	.....	.....
Mulmur, Tp.	.....	.....	3,800	.....	.....
Murray, Tp.	4	4,500	2,050	.....	.....
Muskoka, Tp.	1	1,700	1,266	.....	.....
Nairn and Lorne, Tps.	3	1,000	250	10	.....
Napanee, Tn.	2	6,000	1,000	21,000	.....
Nassagaweya, Tp.	8	9,000	6,000	.....	.....
Neebing, Tp.	3	700	8,000	.....	.....
Neelon and Garson, Tps.	8	4,000	2,400	120	.....
Nelson, Tp.	12	55,000	20,000	.....	.....
Nepean, Tp.	100	100,000	6,476	.....	.....
Nepigon, Tp.	14	20,000	15,000	1,200	3,000
Neustadt, V.	1	4,000	750	.....	.....
New Hamburg, V.	20	30,000	600	.....	25,000
New Liskeard, Tn.	9	21,900	4,539	8,729	85,069
Newboro, V.	3	1,000	300	5	.....
Newburgh, V.	4	2,500	.....	.....	.....
Newbury, V.	5	4,750	130	.....	.....
Newcastle, V.	.....	.....	700	50	.....
Newmarket, Tn.	60	60,000	5,000	.....	42,500
Niagara, Tn.	12	50,300	1,895	2,187	60,000
Niagara, Tp.	4	10,000	2,000	.....	.....
Niagara Falls, C.	102	243,500	35,000	10,000	354,353
Nicholl, Tp.	.....	.....	500	.....	.....
Nipissing, Tp.	4	10,000	232	.....	.....
Nissouri E., Tp.	.....	.....	.....	.....	.....
Nissouri W. Tp.	6	5,000	7,744	116	.....
Normanby, Tp.	1	7,000	.....	.....	.....
North Bay, Tn.	97	127,406	20,329	50,000	175,106
Norwich, V.	4	12,000	2,100	.....	10,000
Norwich N., Tp.	.....	10,000	4,105	81	.....
Norwich S., Tp.	6	7,300	6,465	.....	.....
Norwood, V.	.....	.....	400	.....	.....
Nottawasaga, Tp.	2	2,500	4,603	60	.....
Oakland, Tp.	.....	.....	400	.....	.....
Oakley, Tp.	2	600	2,000	.....	.....
Oakville, Tn.	40	60,000	6,531	.....	80,462
O'Connor, Tp.	8	3,500	727	.....	.....
Oil Springs, V.	.....	.....	.....	.....	.....
Olden, Tp.	3	2,000	1,600	37	.....
Oliver, Tp.	5	800	2,562	.....	6,500
Omemee, V.	2	15,200	368	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Oneida, Tp.	.....	.....	1,500	42	.....
Onondaga, Tp.	2	1,700	5,223	.....	.....
Ops, Tp.	7	10,000	3,855	60	.....
Orangeville, Tn.	2	2,000	.....	45	52,195
Oxford, Tp.	6	14,500	4,318	223	.....
Orillia, Tn.	No report	.....	.....	.....	.....
Orillia, Tp.	20	20,000	4,200	.....	.....
Oro Tp.	15	15,000	1,456	.....	.....
Osgoode, Tp.	.....	.....	5,442	.....	.....
Oshawa, Tn.	100	200,000	52,000	27,000	148,269
Osnabruck, Tp.	67	30,000	4,000	.....	.....
Oso, Tp.	2	5,000	600	.....	.....
Osprey, Tp.	30	28,000	3,203	111	.....
Otonabee Tp.	3	3,500	4,416	60	.....
Ottawa, C.	657	2,997,616	639,923	122,595	3,186,300
Owen Sound, Tn.	31	255,000	19,718	10,544	475,057
Oxford on Rideau, Tps.	4	5,000	1,318	76	.....
Oxford E., Tp.	4	9,500	3,044	62	.....
Oxford N., Tp.	5	1,000	3,000	.....	1,947
Oxford W., Tp.	5	17,000	5,200	107	3,553
Paipoonge, Tp.	.....	.....	3,948	.....	.....
Paisley, V.	.....	.....	1,000	275	18,000
Pakenham, Tp.	4	2,000	1,200	.....	.....
Palmerston, Tn.	3	23,000	3,000	1,500	61,000
Palmerston, N. and S. Canonto Tps.	2	1,600	100	.....	.....
Papineau, Tp.	3	700	.....	.....	.....
Paris, Tn.	20	25,000	4,299	300	145,000
Parkhill, Tn.	5	5,000	5,000	.....	.....
Parry Sound, Tn.	12	25,000	2,000	1,000	137,381
Peel, Tp.	8	12,000	2,000	75	.....
Pelee, Tp.	40	28,000	849	.....	.....
Pelham, Tp.	15	17,500	3,307	22	.....
Pembroke, Tn.	12	50,000	68,000	1,000	150,000
Pembroke, Tp.	10	2,500	87	.....	.....
Penetanguishene, Tn.	25	40,000	500	7,425	70,000
Percy, Tp.	5	1,000	700	.....	.....
Perry, Tp.	.....	.....	525	.....	.....
Perth Tn.	8	48,000	1,842	7,000	14,000
Peterborough, C.	200	345,372	14,223	8,670	527,661
Petewawa, Tp.	10	2,000	150	6	.....
Petrolea, Tn.	6	148,500	19,500	500	190,432
Pickering, Tp.	15	26,000	11,732	248	.....
Picton, Tn.	1	15,000	7,189	132	30,000
Pilkington, Tp.	1	3,000	1,493	.....	.....
Pittsburgh, Tp.	4	4,770	1,890	.....	.....
Plantagenet N., Tp.	8	22,800	500	.....	.....
Plummer Add., Tp.	4	2,250	1,250	.....	.....
Plympton, Tp.	24	12,000	7,178	14	.....
Point Edward, V.	.....	.....	58	.....	.....
Port Arthur, C.	215	595,180	283,679	70,103	2,133,785
Port Carling, V.	5	3,000	780	108	.....
Port Colborne, V.	5	15,000	5,000	.....	30,000
Port Dalhousie, V.	5	6,500	782	50	.....
Port Dover, V.	12	12,100	3,147	.....	.....
Port Elgin, V.	.....	.....	800	.....	42,000
Port Hope, Tn.	19	50,000	30,000	149	110,000

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Port Perry, V.	2	6,000	2,500	.....	23,500
Port Rowan, V.	.....	.....	200	.....	150
Port Stanley, V.	20	8,000	972	35	14,000
Portland, Tp.	4	7,000	4,300	44	.....
Portsmouth, V.	.....	.....	540	.....	.....
Powassan, Tn.	8	15,000	800	200	.....
Prescott, Tn.	.....	.....	5,500	550	118,000
Preston, Tn.	80	275,000	919	1,886	170,458
Prince, Tp.	1	2,000	1,195	.....	.....
Proton, Tp.	10	7,000	4,000	.....	.....
Puslinch, Tp.	10	30,000	.....	180	.....
Radcliffe, Tp.	.....	.....	200	.....	.....
Raglan, Tp.	.....	.....	122	.....	.....
Rainham, Tp.	5	6,000	839	.....	.....
Rainy River, Tn	17	28,000	2,500	13,000	59,000
Raleigh, Tp.	50	50,000	5,000	250	.....
Rama, Tp.	12	8,000	800	.....	.....
Ramsay, Tp.	.....	.....	2,489	23	.....
Ratter and Dunnet, Tps.	2	1,000	1,435	32	.....
Rawdon, Tp.	15	12,000	4,000	.....	.....
Rayside, Tp.	15	6,000	1,400	.....	.....
Reach, Tp.	7	8,000	2,750	48	.....
Renfrew, Tn.	15	20,000	92,120	2,438	244,519
Richmond, Tp.	2	1,000	3,100	.....	.....
Richmond, V.	.....	.....	2,100	.....	.....
Richmond Hill, V.	2	7,000	700	.....	5,000
Ridgetown, Tn.	10	25,000	5,000	500	.....
Rochester, Tp.	3	2,100	1,853	4,230	13,479
Rockland, Tn.	11	5,000	2,500	2,500	.....
Rodney, V.	.....	.....	.....	.....	.....
Rolph, Buchanan, &c., Tps.	3	1,000	540	.....	.....
Romney, Tp.	4	10,000	1,000	50	.....
Ross, Tp.	12	10,000	1,600	64	.....
Roxborough, Tp.	43	12,000	2,200	.....	.....
Russell, Tp.	125	150,000	20,000	.....	.....
Ryde, Tp.	.....	.....	2,000	.....	.....
Ryerson, Tp.	3	3,000	502	43	.....
St. Catharines, C.	134	280,450	60,500	10,000	440,000
St. Edmunds, Tp.	3	31,000	1,200	15	.....
St. Joseph, Tp.	6	5,100	1,433	32	.....
St. Mary's, Tn.	4	10,000	23,163	.....	114,000
St. Thomas, C.	146	285,515	15,200	1,780	650,000
St. Vincent, Tp.	.....	.....	.....	.....	.....
Salter, May and Harrow, Tps.	15	7,000	200	20	.....
Saltfleet, Tp.	50	60,000	5,000	180	.....
Sandfield, Tp.	.....	.....	100	.....	.....
Sandwich, Tn.	43	196,090	5,710	14,336	.....
Sandwich S., Tp.	21	9,860	3,250	42	.....
Sandwich W., Tp.	52	41,600	1,750	.....	.....
Sarawak, Tp.	2	2,500	410	.....	.....
Sarnia, Tn.	13	57,800	3,027	1,555	207,946
Sarnia, Tp.	10	10,000	5,000	20,000	.....
Saugeen, Tp.	3	3,000	4,800	.....	.....
Sault Ste. Marie, Tn.	204	2,394,372	23,716	26,059	.....
Scarborough, Tp.	.....	.....	3,500	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Schreiber, Tp.	9	12,500	.....	.....	.....
Scott, Tp.	6	7,200	1,650	27	.....
Scugog, Tp.	11	7,750	500	.....	.....
Seaforth, Tn.	1	3,000	1,846	800	42,000
Sebastopol, Tp.	.....	.....	64	.....	.....
Seneca, Tp.	4	5,000	2,000	.....	.....
Seymour, Tp.	.....	.....	7,878	.....	.....
Shallow Lake, V.	1	600	100	.....	.....
Sheffield, Tp.	5	13,700	688	.....	.....
Shelburne, V.	3	12,000	3,000	.....	22,000
Shelburne, etc., Tp.	6	3,000	450	20	.....
Sherbrooke, Tp.	3	1,400	225	.....	.....
Sherbrooke S. Tp.	2	1,500	300	.....	.....
Sherwood, Jones, etc., Tps.	20	3,000	400	.....	.....
Shuniah, Tp.	.....	.....	33,000	.....	.....
Sidney, Tp.	20	20,000	5,500	525	.....
Simcoe, Tn.	18	22,000	2,100	400	81,000
Smith, Tp.	11	6,000	2,792	114	.....
Smith's Falls, Tn.	63	250,000	3,000	7,000	200,000
Snowdon, Tp.	3	1,000	.....	.....	.....
Sombra, Tp.	.....	.....	11,109	162	.....
Somerville, Tp.	.....	.....	1,432	.....	.....
Sophiasburg, Tp.	6	6,000	1,865	.....	.....
South River, V.	10	4,000	3,000	.....	.....
Southampton, Tn.	18	12,000	526	53	46,000
Southwold, Tp.	4	5,500	10,000	.....	.....
Springer, Tp.	10	3,000	2,000	200	.....
Springfield, V.	.....	.....	683	7	.....
Stafford, Tp.	6	10,000	1,300	.....	.....
Stamford, Tp.	45	60,000	1,600	.....	.....
Stanhope, Tp.	1	400	113	.....	.....
Stanley, Tp.	12	10,000	4,000	.....	.....
Stayner, Tn.	.....	.....	282	.....	24,000
Steelton, Tn.	151	2,216,925	68,000	41,200	110,000
Stephen, Tp.	20	25,000	6,000	.....	.....
Stephenson, Tp.	8	4,500	2,046	.....	.....
Stirling, V.	1	12,600	8,000	.....	11,000
Stisted, Tp.	6	2,000	294	.....	.....
Storrington, Tp.	5	5,000	2,000	.....	.....
Stouffville, V.	1	2,000	835	.....	25,000
Stratford, C.	50	100,000	78,186	2,710	412,372
Strathroy, Tn.	1	1,500	1,500	500	60,000
Streetsville, V.	.....	.....	1,500	.....	27,800
Strong, Tp.	3	3,000	1,000	15	.....
Sturgeon Falls, Tn.	.....	.....	1,172	1,016	44,376
Sturgeon Point, V.	.....	.....	.....	.....	.....
Sudbury, Tn.	125	200,000	9,689	5,571	151,873
Sullivan, Tp.	5	7,000	5,843	.....	.....
Sundridge, V.	.....	.....	118	.....	.....
Sunnidale, Tp.	10	15,000	3,000	60	.....
Sutton, V.	2	4,500	500	15	.....
Sydenham, Tp.	10	10,000	3,727	.....	.....
Tara, V.	.....	.....	100	33	.....
Tarentorus, Tp.	46	12,150	4,562	.....	.....
Tavistock, V.	2	4,000	2,500	.....	20,000
Tay, Tp.	.....	.....	2,450	.....	.....
Tecumseth, Tp.	25	75,000	3,000	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Teeswater, V.	2	5,000	200	.....	15,000
Tehkummah, Tp.	.....	.....	1,500	.....	.....
Thamesville, V.	1	8,000	500	.....	17,750
Thedford, V.	.....	.....	750	10	.....
Thessalon, Tn.	6	12,000	1,092	54	40,000
Thessalon, Tp.	4	4,500	732	21	.....
Thompson, Tp.	2	300	250	.....	.....
Thorah, Tp.	.....	.....	.....	.....	.....
Thornbury, Tn.	11	13,900	1,546	.....	.....
Thorold, Tn.	5	20,000	6,000	13,355	130,000
Thorold, Tp.	5	5,500	2,600	25	.....
Thurlow, Tp.	6	3,000	2,000	.....	.....
Tilbury, Tn.	5	12,000	1,500	393	10,500
Tilbury E., Tp.	.....	.....	8,737	20,000	.....
Tilbury N., Tp.	20	15,000	5,000	.....	.....
Tilbury W., Tp.	27	17,000	1,200	40	.....
Tillsonburg, Tn.	20	30,000	10,000	12,000	35,000
Tiny, Tp.	8	7,000	1,000	.....	.....
Tisdale, Tp.	300	310,000	.....	.....	.....
Tiverton, V.	.....	.....	500	25	.....
Torbolton, Tp.	.....	.....	533	10	.....
Toronto, C.	9,867	24,374,539	1,885,884	1,700,139	13,450,000
Toronto, Tp.	10	25,000	10,000	.....	.....
Toronto Gore, Tp.	4	8,000	5,000	.....	.....
Toronto N., Tn.	241	381,588	70,491	137,368	104,891
Tossorontio, Tp.	8	8,000	1,500	.....	.....
Tottenham, V.	1	1,000	805	.....	6,000
Townsend, Tp.	10	15,000	3,333	107	.....
Trafalgar, Tp.	.....	.....	6,000	.....	.....
Trenton, Tn.	17	49,000	4,000	300	.....
Tuckersmith, Tp.	5	4,500	5,713	.....	.....
Tudor and Cashel, Tps.	1	1,800	1,548	.....	.....
Turnberry, Tp.	12	10,000	5,500	.....	.....
Tweed, V.	2	4,000	.....	700	.....
Tyendinaga, Tp.	7	5,000	1,921	.....	.....
Usborne, Tp.	8	15,000	3,315	10	.....
Uxbridge, Tn.	1	19,000	653	2,300	.....
Uxbridge, Tp.	10	8,000	1,837	47	.....
Van Horne, Tp.	2	1,750	900	.....	.....
Vankleek Hill, Tn.	.....	.....	1,100	.....	.....
Vaughan, Tp.	18	18,000	6,065	.....	.....
Verulam, Tp.	6	3,400	2,900	.....	.....
Vespra, Tp.	20	20,000	15,000	100	.....
Victoria Harbour, V.	18	13,500	1,609	50	.....
Vienna, V.	1	200	420	.....	.....
Wainfleet, Tp.	.....	.....	2,750	.....	.....
Walkerton, Tn.	4	7,500	2,000	600	45,000
Walkerville, Tn.	67	218,105	88,885	7,100	.....
Wallace, Tp.	12	22,000	3,000	.....	.....
Wallaceburg, Tn.	28	122,475	30,000	1,000	.....
Walpole, Tp.	14	8,500	8,695	34	.....
Walsingham N., Tp	5	4,000	2,573	.....	.....
Walsingham S., Tp.	9	3,900	2,500	.....	.....
Wardsville, V.	1	1,200	200	.....	.....

MUNICIPAL STATISTICS.—*Continued.*

Cities, Towns, Villages and Townships.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Warwick, Tp.	6	3,000	2,500	21	.....
Waterdown, V.	.....	.....	1,500	24	6,500
Waterford, V.	2	3,000	443	30	.....
Waterloo, Tn.	60	150,000	41,500	4,236	198,300
Waterloo, Tp.	21	18,000	2,100	.....	.....
Waters, Tp.	4	2,000	795	.....	.....
Watford, V.	1	3,000	201	.....	.....
Watt, Tp.	5	2,000	1,541	.....	.....
Wawanosh E., Tp.	5	3,450	11,569	66	.....
Wawanosh W., Tp.	4	8,000	1,000	50	.....
Webbwood, Tn.	6	4,500	400	175	.....
Welland, Tn.	108	324,000	18,941	9,800	165,000
Wellesley, Tp.	25	12,800	6,407	126	.....
Wellington, V.	2	3,000	960	94	.....
West Lorne, V	11	12,000	1,750	.....	.....
Westmeath, Tp.	.....	.....	3,042	15	.....
Westminster, Tp.	.....	.....	7,441	135	.....
Weston, V.	30	70,000	1,032	.....	107,000
Westport, V.	4	10,950	2,000	.....	.....
Whitby, Tn.	9	21,000	7,500	.....	90,000
Whitby, Tp.	6	10,000	2,000	.....	.....
Whitby E., Tp.	6	5,000	4,000	.....	.....
Whitchurch, Tp.	1	4,300	2,504	.....	.....
Wiarton, Tn.	5	25,000	443	1,234	50,084
Widdifield, Tp.	12	4,800	472	.....	.....
Wilberforce & Algoma, N., Tps.	.....	.....	600	.....	.....
Williams E., Tp.	7	6,000	2,000	.....	.....
Williamsburg, Tp.	6	8,000	5,125	20	.....
Willoughby, Tp.	.....	.....	1,500	.....	.....
Wilmot, Tp.	.....	.....	4,923	255	.....
Winchester, Tp.	14	70,000	5,963	.....	.....
Winchester, V.	.....	.....	100	.....	.....
Windham, Tp.	21	9,170	2,000	100	.....
Windsor, C.	300	3,161,225	62,345	19,307	305,000
Wingham, Tn.	3	3,000	1,373	4,870	78,500
Wolfe Island, Tp.	.....	.....	300	.....	20,000
Wolford, Tp.	4	3,000	450	.....	.....
Wollaston, Tp.	3	1,000	1,150	50	.....
Woodbridge, V.	1	1,500	3,900	.....	100
Woodhouse, Tp.	50	75,000	6,200	60	.....
Woodstock, C.	20	200,000	5,000	1,500	328,497
Woodville, V.	.....	.....	50	.....	.....
Woolwich, Tp.	7	10,000	4,810	.....	.....
Worthington and Blue, Tps.	7	2,800	3,291	.....	.....
Wroxeter, V.	.....	.....	46	.....	1,900
Wyoming, V.	3	3,700	1,300	.....	.....
Yarmouth, Tp.	19	22,500	11,896	340	.....
Yonge Front, Tp.	.....	.....	1,487	77	.....
Yonge and Escott, Rear, Tps.	3	3,000	568	.....	.....
York, Tp.	300	180,000	41,473	1,473	.....
Zone, Tp.	2	1,800	1,500	16	.....
Zorra E., Tp.	53	32,000	9,000	150	.....
Zorra W., Tp.	14	7,000	3,700	1,106	.....

MUNICIPAL STATISTICS.—*Concluded.*

SUMMARY.

Cities.	No. of new buildings erected during 1911.	Aggregate cost new buildings.	Spent on permanent improvements.	Spent on sanitation, including sewers.	Public utilities.
	No.	$	$	$	$
Belleville	65	300,000	64,000	70,000	282,000
Berlin	197	364,693	65,062	16,204	794,544
Brantford	531	613,860	80,163	67,671	512,311
Chatham	84	355,147	26,979	6,573	248,500
Fort William	479	3,077,860	205,829	148,562	1,792,799
Guelph	106	513,690	31,250	19,116	912,791
Hamilton	1,887	4,173,105	52,800	255,000	2,760,000
Kingston	52	151,230	12,059	1,266	705,855
London	1,039	1,036,880	1,123,435	517,638	2,123,404
Niagara Falls	102	243,500	35,000	10,000	354,353
Ottawa	657	2,997,616	639,923	122,595	3,186,300
Peterborough	200	345,372	14,223	8,670	527,661
Port Arthur	215	595,180	283,679	70,103	2,133,785
St. Catharines	134	280,450	60,500	10,000	440,000
St. Thomas	146	285,515	15,200	1,780	650,000
Stratford	50	100,000	78,186	2,710	412,372
Toronto	9,867	24,374,539	1,885,884	1,700,139	13,450,000
Windsor	300	3,161,225	62,345	19,307	305,000
Woodstock	20	200,000	5,000	1,500	328,497
19 Cities	16,131	43,169,862	4,741,516	3,048,834	31,920,172
127 Towns	3,019	10,597,482	868,063	526,511	9,192,953
141 Villages	740	1,256,800	101,645	12,806	1,346,856
520 Townships	5,440	5,365,873	1,837,831	109,801	213,783
807 Grand Totals	25,330	60,390,017	7,614,496	3,714,988	43,402,064

PUBLIC UTILITIES CLASSIFIED.

The following table gives, in a classified form, the public utilities owned and operated by the municipalities, an additional column to contain this information having been appended to the municipal tables for the last four years. Again there is a satisfactory increase of these operations.

Municipalities.	(1) Water Works.	(2) Electric Lighting.	(3) Gas Works.	(4) Street Railways.	(5) Power Plant.	(6) Telephone System.	(7) Miscellaneous.
	$	$	$	$	$	$	$
Acton, V.	.....	10,000	.....	.....	.....	.....	.....
Albemarle, Tp.	1,000	.....	.....	.....	.....	.....	.....
Alexandria, Tn.	47,500	with (1)	.....	.....	.....	.....	.....
Alliston, Tn.	20,000	.....	.....	.....	.....	.....	.....
Almonte, Tn.	.....	40,000	.....	.....	.....	.....	.....
Amherstburg, Tn.	40,000	4,500	.....	.....	.....	.....	.....
Arnprior, Tn.	118,300	.....	.....	.....	.....	.....	.....
Aurora, Tn.	35,000	.....	.....	.....	.....	.....	.....
Aylmer, Tn.	100,000	35,000	.....	.....	.....	.....	.....
Barrie, Tn.	123,389	85,675	.....	.....	with (2)	.....	.....
Bath, V.	.....	225	.....	.....	.....	.....	.....
Beamsville, V.	27,000	.....	.....	.....	.....	.....	.....
Beeton, V.	20,000	4,000	.....	.....	.....	.....	.....
Belleville, C.	192,000	.....	90,000	.....	.....	.....	.....
Berlin, C.	260,765	398,586	with (2)	135,193	.....	.....	.....
Blenheim, Tn.	.....	12,500	.....	.....	.....	.....	.....
Blyth, V.	.....	8,000	.....	.....	.....	.....	.....
Bobcaygeon, V.	.....	25,000	.....	.....	.....	.....	.....
Bothwell, Tn	4,500	6,000	.....	.....	.....	.....	.....
Bracebridge, Tn.	163,000	with (1)	.....	.....	with (1)	.....	.....
Brampton, Tn.	70,000	.....	.....	.....	55,000	.....	.....
Brantford, C.	512,311	.....	.....	.....	.....	.....	.....
Bridgeburg, V.	52,000	.....	.....	.....	.....	.....	.....
Brockville, Tn.	262,693	103,255	113,270	.....	.....	.....	.....
Burk's Falls, V.	37,000	.....	.....	.....	.....	.....	.....
Burlington, V.	60,000	.....	.....	.....	.....	.....	.....
Campbellford, Tn.	169,000	with (1)	.....	.....	with (1)	.....	.....
Casselman, V.	.....	.....	.....	.....	.....	.....	5,000
Chapleau, Tp.	40,094	.....	.....	.....	.....	.....	.....
Chatham, C.	225,000	23,500	.....	.....	.....	.....	.....
Chesley, Tn.	42,320	.....	.....	.....	.....	.....	.....
Chinguacousy, Tp.	.....	.....	.....	.....	.....	30,000	.....
Chippawa, V.	.....	600	.....	.....	.....	.....	.....
Clifford, V.	.....	.....	3,000	.....	.....	.....	.....
Clinton, Tn.	69,000	.....	.....	.....	.....	.....	.....
Cobalt, Tn.	110,000	.....	.....	.....	.....	.....	.....
Cochrane, Tn.	54,000	.....	.....	.....	.....	.....	.....
Colchester, N., Tp.	.....	.....	.....	.....	.....	10,154	.....
Coldwater, V.	23,000	.....	.....	.....	.....	.....	.....
Collingwood, Tn.	73,915	47,485	.....	.....	.....	.....	.....
Collingwood, Tp.	7,000	.....	.....	.....	.....	.....	.....
Cornwall, Tn.	142,632	.....	.....	.....	.....	.....	.....
Creemore, V.	20,000	.....	.....	.....	.....	.....	.....

PUBLIC UTILITIES CLASSIFIED.—*Continued.*

Municipalities.	(1) Water Works.	(2) Electric Lighting.	(3) Gas Works.	(4) Street Railways.	(5) Power Plant.	(6) Telephone System.	(7) Miscellaneous.
	$	$	$	$	$	$	$
Dawn, Tp.	.....	.....	.....	.....	.....	10,000	.....
Deseronto, Tn.	60,000	.....	25,000	.....	.....	.....	.....
Dresden, Tn.	16,000	14,500	.....	.....	.....	.....	.....
Drury, etc., Tps.	.....	226	.....	.....	.....	.....	.....
Dundalk, V.	.....	8,000	.....	.....	.....	.....	.....
Dundas, Tn.	67,003	12,667	.....	.....	with (2)	.....	.....
Dunnville, Tn.	31,000	.....	.....	.....	.....	.....	.....
Dysart, etc., Tps.	.....	400	.....	.....	.....	.....	.....
Elmira, V.	35,000	.....	.....	.....	.....	.....	.....
Essex, Tn.	33,000	.....	.....	.....	.....	.....	.....
Exeter, V.	22,000	.....	.....	.....	.....	.....	.....
Fenelon Falls, V.	.....	75,000	.....	.....	.....	.....	.....
Fergus, V.	35,000	.....	.....	.....	.....	.....	.....
Fort Erie, V.	55,000	4,000	.....	.....	.....	.....	.....
Fort Frances, Tn.	82,620	16,637	.....	.....	.....	.....	.....
Fort William, C.	877,433	211,366	.....	505,000	.....	199,000	.....
Galt, Tn.	222,943	100,000	.....	.....	.....	.....	.....
Gananoque, Tn.	260,000	.....	.....	.....	.....	.....	.....
Georgetown, V.	43,000	.....	.....	.....	.....	.....	.....
Glencoe, V.	.....	12,000	.....	.....	.....	.....	.....
Gloucester, Tp.	5,000	.....	.....	.....	.....	.....	.....
Goderich, Tn.	131,674	with (1)	.....	.....	.....	.....	.....
Goderich, Tp.	.....	.....	.....	.....	.....	11,000	.....
Gosfield, N., Tp.	.....	.....	.....	.....	.....	15,125	.....
Gravenhurst, Tn.	30,000	95,000	.....	.....	with (2)	.....	.....
Grimsby, V.	60,000	.....	.....	.....	.....	.....	.....
Guelph, C.	341,048	421,044	with (2)	150,699	.....	.....	.....
Haileybury, Tn.	101,095	.....	.....	.....	.....	.....	.....
Hamilton, C.	2,700,000	60,000	.....	.....	.....	.....	.....
Hanover, Tn.	31,000	.....	.....	.....	.....	.....	.....
Harriston, Tn.	35,000	.....	.....	.....	.....	.....	.....
Harvey, Tp.	.....	.....	.....	.....	.....	1,500	.....
Hawkesbury, Tn.	110,000	.....	.....	.....	.....	.....	.....
Hespeler, Tn.	.....	28,000	.....	.....	with (2)	.....	.....
Huntsville, Tn.	40,000	with (1)	.....	.....	.....	.....	.....
Ingersoll, Tn.	125,000	80,000	.....	.....	.....	.....	.....
Iroquois, V.	40,000	with (1)	.....	.....	.....	.....	.....
Kearney, Tn.	700	.....	.....	.....	.....	.....	.....
Kenora, Tn.	212,872	43,159	.....	.....	507,637	17,453	.....
Kincardine, Tn.	47,107	21,196	.....	.....	.....	.....	.....
King, Tp.	.....	1,800	.....	.....	.....	.....	.....
Kingston, C.	322,287	383,568	.....	.....	.....	.....	.....
Kingsville, Tn.	35,000	.....	.....	.....	.....	.....	.....
Latchford, Tn.	.....	.....	.....	.....	.....	.....	.....
Leamington, Tn.	26,000	.....	25,000	.....	.....	.....	.....
Lindsay, Tn.	125,000	.....	.....	.....	.....	.....	.....
Listowel, Tn.	303,000	16,000	.....	.....	.....	.....	.....
London, C.	1,123,404	1,000,000	.....	.....	with (2)	.....	.....
Lucan, V.	.....	5,000	.....	.....	.....	.....	.....
Lucknow, V.	10,000	.....	.....	.....	.....	.....	.....

PUBLIC UTILITIES CLASSIFIED.—*Continued.*

Municipalities.	(1) Water Works.	(2) Electric Lighting.	(3) Gas Works.	(4) Street Railways.	(5) Power Plant.	(6) Telephone System.	(7) Miscellaneous.
	$	$	$	$	$	$	$
Madoc, V.	.....	15,000	.....	.....	.....	.....	.....
Maidstone, Tp.	.....	.....	.....	.....	.....	12,005	.....
Markdale, V.	30,000	.....	.....	.....	.....	.....	.....
Markham, V.	15,000	with (1)	.....	.....	.....	.....	.....
Marmora, V.	.....	5,000	.....	.....	.....	.....	.....
Massey, Tn.	22,670	.....	.....	.....	.....	.....	.....
Meaford, Tn.	30,000	.....	.....	.....	.....	.....	.....
Medonte, Tp.	.....	.....	.....	.....	.....	20,000	.....
Merriton, V.	86,181	12,000	.....	.....	with (2)	.....	.....
Midland, Tn.	94,000	50,000	.....	.....	.....	.....	.....
Milton, Tn.	35,000	15,500	.....	.....	.....	.....	.....
Mimico, V.	.....	13,000	.....	.....	with (2)	.....	.....
Mitchell, Tn.	35,000	.....	.....	.....	.....	.....	.....
Morris, Tp.	.....	.....	.....	.....	.....	8,000	.....
Morrisburg, V.	35,000	30,000	.....	.....	.....	.....	.....
Mount Forest, Tn.	30,000	15,000	.....	.....	.....	.....	.....
Neepigon, Tp.	3,000	.....	.....	.....	.....	.....	.....
New Hamburg, V.	.....	25,000	.....	.....	.....	.....	.....
New Liskeard, Tn.	85,069	.....	.....	.....	with (2)	.....	.....
Newmarket, Tn.	42,500	with (1)	.....	.....	.....	.....	.....
Niagara, Tn.	36,000	24,000	.....	.....	.....	.....	.....
Niagara Falls, C.	217,380	136,973	.....	.....	.....	.....	.....
North Bay, Tn.	175,106	.....	.....	.....	.....	.....	.....
Norwich, V.	.....	10,000	.....	.....	with (2)	.....	.....
Oakville, Tn.	63,038	17,425	.....	.....	.....	.....	.....
Oliver, Tp.	.....	.....	.....	.....	.....	6,500	.....
Orangeville, Tn.	52,195	.....	.....	.....	.....	.....	.....
Orillia, Tn.	No report	.....	.....	.....	.....	.....	.....
Oshawa, Tn.	148,269	.....	.....	.....	.....	.....	.....
Ottawa, C.	2,756,300	430,000	.....	.....	with (2)	.....	.....
Owen Sound, Tn.	260,659	120,995	93,400	.....	with (2)	.....	.....
Oxford, N., Tp.	.....	1,947	.....	.....	with (2)	.....	.....
Oxford, W., Tp.	.....	3,553	.....	.....	with (2)	.....	.....
Paisley, V.	18,000	.....	.....	.....	.....	.....	.....
Palmerston, Tn.	45,000	16,000	.....	.....	.....	.....	.....
Paris, Tn.	88,000	57,000	.....	.....	.....	.....	.....
Parry Sound, Tn.	63,752	73,629	.....	.....	with (2)	.....	.....
Pembroke, Tn.	150,000	.....	.....	.....	.....	.....	.....
Penetanguishene, Tn.	46,000	24,000	.....	.....	with (2)	.....	.....
Perth, Tn.	.....	14,000	.....	.....	.....	.....	.....
Peterborough, C.	527,661	.....	.....	.....	.....	.....	.....
Petrolea, Tn.	190,432	.....	.....	.....	.....	.....	.....
Picton, Tn.	30,000	with (1)	.....	.....	.....	.....	.....
Port Arthur, C.	792,705	108,500	.....	686,380	374,500	171,700	.....
Port Colborne, V.	30,000	.....	.....	.....	.....	.....	.....
Port Elgin, V.	42,000	.....	.....	.....	.....	.....	.....
Port Hope, Tn.	110,000	.....	.....	.....	.....	.....	.....
Port Perry, V.	23,500	with (1)	.....	.....	.....	.....	.....
Port Rowan, V.	.....	150	.....	.....	.....	.....	.....
Port Stanley, V.	.....	14,000	.....	.....	with (2)	.....	.....
Prescott, Tn.	100,000	18,000	.....	.....	.....	.....	.....
Preston, Tn.	100,600	69,858	.....	.....	with (2)	.....	.....
Rainy River, Tn.	59,000	.....	.....	.....	.....	.....	.....
Renfrew, Tn.	126,312	with (5)	.....	.....	118,207	.....	.....

PUBLIC UTILITIES CLASSIFIED.—*Concluded.*

Municipalities.	(1) Water Works.	(2) Electric Lighting.	(3) Gas Works.	(4) Street Railways.	(5) Power Plant.	(6) Telephone System.	(7) Miscellaneous.
	$	$	$	$	$	$	$
Richmond Hill	.....	5,000	.....	.....	.....	.....	.....
Rochester, Tp.	.....	.....	.....	.....	.....	13,479	.....
St. Catharine's, C.	340,000	.....	100,000	.....	.....	.....	.....
St. Mary's, Tn	70,000	29,000	.....	.....	15,000	.....	.....
St. Thomas, C.	300,000	75,000	200,000	75,000	with (2)	.....	.....
Sandwich, Tn.	.....	.....	.....	.....	.....	.....	.....
Sarnia, Tn.	207,946	.....	.....	.....	.....	.....	.....
Seaforth, Tn.	17,000	25,000	.....	.....	.....	.....	.....
Shelburne, V.	22,000	.....	.....	.....	.....	.....	.....
Simcoe, Tn.	81,000	.....	.....	.....	.....	.....	.....
Smith's Falls, Tn.	200,000	.....	.....	.....	.....	.....	.....
Southampton, Tn.	46,000	.....	.....	.....	.....	.....	.....
Stayner, Tn.	24,000	.....	.....	.....	.....	.....	.....
Steelton, Tn.	80,000	30,000	.....	.....	.....	.....	.....
Stirling, V.	.....	11,000	.....	.....	with (2)	.....	.....
Stouffville, V.	25,000	.....	.....	.....	.....	.....	.....
Stratford, C.	264,187	148,186	.....	.....	.....	.....	.....
Strathroy, Tn.	60,000	with (1)	.....	.....	.....	.....	.....
Streetsville, V.	27,800	with (1)	.....	.....	.....	.....	.....
Sturgeon Falls, Tn.	44,376	.....	.....	.....	.....	.....	.....
Sudbury, Tn.	151,873	with (1)	.....	.....	.....	.....	.....
Tavistock, V.	20,000	.....	.....	.....	.....	.....	.....
Teeswater, V.	15,000	.....	.....	.....	.....	.....	.....
Thamesville, V.	11,500	6,250	.....	.....	.....	.....	.....
Thessalon, Tn.	40,000	with (1)	.....	.....	.....	.....	.....
Thorold, Tn.	100,000	30,000	.....	.....	.....	.....	.....
Tilbury, Tn.	10,500	.....	.....	.....	.....	.....	.....
Tillsonburg, Tn.	.....	35,000	.....	.....	with (2)	.....	.....
Toronto, C.	8,500,000	4,950,000	.....	.....	.....	.....	.....
Toronto, N., Tn.	74,891	30,000	.....	.....	.....	.....	.....
Tottenham, V.	.....	6,000	.....	.....	.....	.....	.....
Uxbridge, Tn.	.....	.....	.....	.....	.....	.....	.....
Walkerton, Tn.	45,000	.....	.....	.....	.....	.....	.....
Waterdown, V.	.....	.....	.....	.....	6,500	.....	.....
Waterloo, Tn.	100,000	55,700	42,600	.....	.....	.....	.....
Welland, Tn.	165,000	.....	.....	.....	.....	.....	.....
Weston, V.	80,000	27,000	.....	.....	.....	.....	.....
Whitby, Tn.	90,000	with (1)	.....	.....	.....	.....	.....
Wiarton, Tn.	50,084	.....	.....	.....	.....	.....	.....
Wilmot, Tp.	.....	.....	.....	.....	.....	.....	.....
Windsor, C.	275,000	30,000	.....	.....	.....	.....	.....
Wingham, Tn.	41,500	37,000	.....	.....	.....	.....	.....
Wolfe Island, Tp.	.....	.....	.....	.....	.....	.....	20,000
Woodbridge, V.	.....	.....	100	.....	.....	.....	.....
Woodstock, C.	218,278	110,219	.....	.....	with (2)	.....	.....
Woodville, V.	.....	.....	.....	.....	.....	.....	.....
Wroxeter, V.	.....	1,900	.....	.....	.....	.....	.....
Totals	29,117,978	10,346,534	692,380	1,552,272	1,116,844	510,791	25,000
Grand Total	43,402,064						

FREE EMPLOYMENT BUREAUS.

The five Free Employment offices operated by Branches of this Bureau at Brantford, Hamilton, London, Ottawa and Berlin and the new Branch at Walkerville have been carried on during the year with increased success. The details are tabulated below.

Applications for 1912.

Location.	Applications for work.		Help wanted.		Situations filled.	
	Male.	Female.	Male.	Female.	Male.	Female.
Brantford:—						
January	28	.....	30	.....	21	.....
February	25	4	18	5	16	3
March	29	2	21	3	13	2
April	22	.....	31	2	17	.....
May	31	3	31	2	20	.....
June	19	3	26	1	13	1
July	32	1	44	2	24	1
August	29	3	35	3	21	3
September	21	5	51	15	15	3
October	52	2	98	6	28	.....
November	32	1	49	1	24	1
December	22	1	21	4	16	.....
Totals	342	25	455	44	228	14
Hamilton:—						
January	14	.....	11	.....	11	.....
February	28	1	16	1	15	1
March	32	.....	17	1	17	.....
April	21	1	19	1	19	1
May	18	1	15	1	15	1
June	26	1	31	.....	24	.....
July	19	.....	29	.....	19	.....
August	15	.....	25	.....	15	.....
September	20	2	20	2	20	2
October	22	.....	26	.....	22	.....
November	28	1	25	.....	25	.....
December	23	.....	28	.....	23	.....
Totals	266	7	262	6	225	5
London:—						
January	9	.....	7	.....	7	.....
February	13	.....	4	.....	4	.....
March	10	.....	5	.....	5	.....
April	51	1	32	1	34	1
May	35	.....	30	.....	30	.....
June	32	1	27	1	27	1
July	26	1	21	1	21	1
August	26	1	25	1	25	1
September	16	1	27	1	15	1
October	12	.....	15	.....	10	.....
November	21	.....	22	.....	20	.....
December	21	.....	17	.....	17	.....
Totals	272	5	232	5	215	5

Applications for 1912.—*Concluded.*

Location.	Applications for work.		Help wanted.		Situations filled.	
	Male.	Female.	Male.	Female.	Male	Female.
Ottawa:—						
January	35	2	12	1	12	1
February	33	.....	7	.....	7	.....
March	56	5	19	7	19	4
April	110	.....	47	2	47	.....
May	84	3	31	2	31	2
June	40	.....	6	.....	6	.....
July	17	1	9	.....	9	.....
August	37	.....	13	.....	13	.....
September	23	3	9	2	9	2
October	27	3	15	.....	15	.....
November	53	5	19	6	19	5
December	70	4	6	1	6	1
Totals	585	26	193	21	193	15
Walkerville;—						
April	11	.....	11	.....	4	.....
May	20	.....	23	.....	9	.....
June	19	.....	21	.....	14	.....
July	11	1	18	1	7	1
August	11	.....	7	.....	7	.....
September	24	2	25	2	23	2
October	28	4	33	1	26	1
November	27	.....	29	.....	19	.....
December	47	.....	33	.....	29	.....
Totals	198	7	200	4	138	4
Berlin:—						
April	47	2	52	8	40	2
May	35	.....	61	.....	33	.....
June	23	1	42	24	21	1
July	19	6	60	106	19	6
August	20	.....	40	.....	20	.....
September	17	.....	45	.....	17	.....
October	15	2	32	37	15	2
November	15	.....	44	30	15	.....
December	60	.....	96	70	60	.....
Totals	251	11	472	275	240	11
Grand Totals	1,914	81	1,814	355	1,239	54

Applications by Trades for 1912.

Trade or Calling.	Applications for work.		Help wanted.		Situations filled.	
	Male.	Female.	Male.	Female.	Male.	Female.
Agents	1					
Auto Assemblers	6		5		4	
Auto Back and Door Hangers	9		4		4	
Auto Finishers	1					
Auto Inspector	1					
Auto Repairers	2		1		1	
Auto Trimmers	8		12		8	
Bakers	2		2		2	
Baggagemen	1		1		1	
Band Sawyers	1		1		1	
Barbers	5		1		1	
Bench Hands			2			
Blacksmiths	24		16		15	
Boilermakers	1		1		1	
Bookkeepers	2	1				
Bricklayers	26		21		17	
Bush Hands	4		3		3	
Buss Planers			2			
Cabinetmakers			3			
Caretakers	3		1		1	
Carpenters	141		174		107	
Cellar Man	1					
Cement Workers	1		3		1	
Chauffeurs	3					
Clerks	33	1	7	1	8	1
Coachman	1					
Collectors	1					
Conductors	1					
Cooks	4	6		1		1
Coppersmiths	2		2		2	
Curriers	3					
Delivery Boys	1		1		1	
Die Setters	1		1		1	
Die Sinkers	1		1		1	
Domestics	1	54	1	69	1	37
Drill Press Hands	2		1			
Electricians	4		1		1	
Factory Hands			6	178		
Farm Hands	90	3	116	2	78	2
Fitters	1		1		1	
Finishers	1					
Firemen	6		3		1	
Floor Hands			1			
Foremen	8		4		4	
Furniture Packer	1					
Gardeners	16		12		9	
Grooms	8		5		5	
Housekeepers		3		2		2
Improvers	2		2		2	
Iron Workers	3		1		1	
Janitors	2		2		2	

Applications by Trades for 1912.—*Concluded.*

Trade or calling.	Applications for work.		Help wanted.		Situations filled.	
	Male.	Female.	Male.	Female.	Male.	Female.
Labourers, Brewery	2	.....	3	.....	2	.....
Labourers	1,258	.....	1,131	.....	795	.....
Laundress	.....	1	.....	1	.....	1
Machine Operators	6	.....	14	91	5	.....
Machinists	21	.....	14	.....	12	.....
Metal Workers	1	.....	.....	.....	.....	.....
Millers	1	.....	.....	.....	.....	.....
Mill Hands	1	.....	1	.....	1	.....
Millwright	1	.....	1	.....	1	.....
Moulders	7	.....	4	.....	3	.....
Packers	1	.....	1	.....	1	.....
Painters, etc.	49	.....	82	.....	36	.....
Plasterers	1	.....	1	.....	1	.....
Plumbers	1	.....	.....	.....	.....	.....
Porters	14	.....	11	.....	4	.....
Printers	5	.....	2	.....	1	.....
Rubber Workers	6	.....	12	.....	6	.....
Scrub Woman	.....	1	.....	1	.....	1
Shaper Hands	2	.....	4	.....	2	.....
Sheetiron Workers	1	.....	.....	.....	.....	.....
Shippers	5	.....	4	.....	4	.....
Shoe Clerks	1	.....	.....	.....	.....	.....
Stable Man	1	.....	.....	.....	.....	.....
Steamfitters	6	.....	7	.....	5	.....
Stenographers	.....	2	.....	.....	.....	.....
Stovemakers	1	.....	1	.....	1	.....
Tailors	2	.....	10	.....	3	.....
Tanners	3	.....	.....	.....	.....	.....
Teamsters	62	.....	70	.....	59	.....
Threshers	1	.....	.....	.....	.....	.....
Tinsmiths	2	.....	2	.....	1	.....
Tool Dressers	2	.....	2	.....	2	.....
Trimmers	3	.....	6	.....	3	.....
Upholsterers	.....	.....	8	.....	.....	.....
Vise Hands	.....	.....	1	.....	.....	.....
Waiters	3	1	2	1	2	1
Warehousemen	1	.....	1	.....	1	.....
Washerwomen	.....	8	.....	8	.....	8
Watchmen	7	.....	4	.....	3	.....
Yardmen	.....	.....	4	.....	.....	.....
Totals	1,914	81	1,814	355	1,239	54

LABOUR ORGANIZATIONS.

The usual increase of returns from the labour organizations continued, but still the list is far from complete. It is not from want of effort to make it so, for there have been repeated appeals, but still many of the secretaries manifest a strange reluctance to do their part in showing organized labour in its full proportions.

Allandale.

Name,—Brotherhood of Locomotive Engineers, Division No. 486. Organized Feb. 2, 1892; total membership, 75; wages paid on mileage basis; average earnings per hour, pro rata; number of working hours, varies; wages paid monthly; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 75; no difference in wages or hours of labour of those engaged at trade in locality between members and non-members; no cash benefits. President, T. C. Royce, Box 212, Allandale; Corresponding Secretary, John Lowe, Box 24, Allandale; meets first Sunday and third Monday in month.

Name.—Order of Railway Conductors, Division No. 355. Organized August 2, 1893; total membership, 42; average earnings per week, $25; average earnings per hour, 35c.; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 50; no difference in wages or hours of those engaged at trade in locality; death benefits, $1,000 to $5,000; no special work for members. President, A. B. Garrettson, Cedar Rapids, Iowa, U.S.A.; Corresponding Secretary, James P. McMillin, Box 35, Cumberland Street, Allandale; meets third Sunday in each month.

Brotherhood of Railroad Trainmen, No. 377. Organized June 16, 1885; total membership, 114; average earnings per week, pro rata; average earnings per hour, 24c.; number of working hours first five days, mileage system; number on Saturday, mileage system; wages paid monthly; average number of days idle per member during year, varies; general cause of idleness, winter weather; total number (union and non-union) employed at calling in locality, 150; no difference in wages or hours between members and non-members; cash benefits, death, according to class insured; no special work for members. President, C. McNiven, Box 64, Allandale; Corresponding Secretary, W. H. Fell, Burton Avenue, Allandale; meets second Wednesday, 8 p.m., fourth Sunday, 2.30 p.m., every month.

Amherstburg.

Name.—International Longshoremen's Association, No. 377. Organized August 12, 1911; total membership, 22; average earnings per week, $21.53; average earnings per hour, 31c.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly; body incorporated and registered. President, Robert Kitt, Amherstburg; Corresponding Secretary, Albert Brown, Amherstburg; meets first Mondays in month.

Name.—International Rock Drillers' Association. Organized 1892; total membership, 261; average earnings per week, $19.80; average earnings per hour, 30c.; number of working hours first five days, 55; number on Saturday, 11; wages paid fortnightly; average number of days idle per member during year, 100; general cause of idleness, cold weather and ice; total number (union and non-union) employed at trade in locality, 161; all are members of organization; no special work for members; body incorporated and registered. President, Robert Kitt,

Amherstburg, Ont.; Corresponding Secretary, Lemuel A. Parker, Amherstburg, Ont.; meets first Monday in month.

Name,—International Brotherhood of Steam Shovel and Dredgemen, No. 20. Organized Feb. 16, 1904; total membership, 32; average earnings per week, $30; average earnings per hour, 35c.; number of working hours first five days, 12; number on Saturday, 12; wages paid fortnightly; average number of days idle per member during year, 60; general cause of idleness, dredges laid up during winter months; total number (union and non-union) employed at calling in locality, 5; all are members of organization; no special work for members; body incorporated and registered. President, W. G. Raines, Amherstburg, Ont.; Corresponding Secretary, J. J. Ryan, Box 196, Amherstburg, Ont.; meets at call of officers.

Beaverton.

Name,—International Brotherhood of Maintenance of Way Employes, No. 262. Organized January, 1910; total membership, 20; average earnings per week, $10; average earnings per hour, 15½c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly. President, William C. Doxsee, Staney Brae; Corresponding Secretary, F. Quinton, Udney P.O., Ontario.

Belleville.

Name,—Bricklayers', Masons' and Plasterers' Union, No. 30. Organized September, 1905; total membership, 26; average earnings per week, $18; average earnings per hour, 35c.; number of working hours first five days, 45; number on Saturday, 9; wages paid weekly and fortnightly; average number of days idle per member during year, 84; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 35; difference in wages or hours of labour of those engaged at trade in locality, non-union work 10 hours for $3; union 9 hours for $3.60; cash benefits, death, $250; body incorporated and registered. President, William Johnson, care Belleville Post Office; Corresponding Secretary, A. G. Coe, Mill Street, care Belleville Post Office; meets first and third Mondays in month.

Name,—Brotherhood of Locomotive Engineers, No. 189. Organized Dec. 23, 1875; total membership, 68; average earnings per week, $35; average earnings per hour, 40c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; average number of days idle per month during year, 15; total number (union and non-union) employed at calling in locality, 150; no difference in wages or hours between members and non-members; cash benefits, sickness, 50c. per day; death, $1,500 to $4,500; reading-room for use of members; body incorporated and registered. President, William Rogers, Belleville Station; Corresponding Secretary, H. Lavois, Box 34, Belleville Station; meets first and third Tuesdays in month.

Name,—Brotherhood of Locomotive Firemen and Enginemen (Challenge Lodge), No. 66. Organized 1877; total membership, 110; average earnings per week, $20; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 130; no difference in wages or hours between members and non-members; cash benefits, sickness, 50c. per day; death, $500 to $3,000; out of work benefits, dues remitted; body incorporated and registered. President, W. V. Fairbairn, Belleville Station; Corresponding Secretary, Robt. J. Milne, Belleville Station; meets second and fourth Tuesdays in month.

BERLIN.

Name,—Journeymen Barbers' International Union, No. 304. Organized July 29, 1902; total membership, 13; average earnings per week, $13; average earnings per hour, 17¼c.; number of working hours first five days, 60; number on Saturday, 16; wages paid weekly; no idle days; cash benefits, sickness, $5 per week; body incorporated and registered. President, Chas. Knapp, Courtland Avenue; Corresponding Secretary, F. J. Fitt, care J. Zaiger, King Street; meets third Monday in month.

Name,—Brewery Workers' (Twin City) Union, No. 170. Organized Feb. 17, 1909; total membership, 70; average earnings per week, $13; average earnings per hour, 22½c.; number of working hours first five days, 50 for six months; 45 for six months; number on Saturday, 8 for six months; 7 for six months; wages paid fortnightly; no idle days; total number (union and non-union) employed at trade in locality, 75 to 90; difference in wages and hours between members and non-members, $1.50 to $2 per week; no special work for members. President, W. Massel, Park Street, Waterloo; Corresponding Secretary, J. Boegel, Box 221, John Street, Waterloo; meets second and fourth Tuesday in month.

Name,—Bricklayers', Masons' and Plasterers' International Union, No. 12. Organized 1900; total membership, 70; average earnings per week, $21.60; average earnings per hour, 45c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 90; difference in wages or hours of labour between members and non-members, non-union 10 hours per day; 30c. per hour; union, 45c. per hour; cash benefits, death, $300; no special work for members. President, A. P. Plummer, 108 Weber Street East; Corresponding Secretary, Albert J. Weber, 345 King Street West; meets every Friday in month.

Name,—United Brotherhood of Carpenters and Joiners, No. 553. Organized April 14, 1900; total membership, 25; average earnings per week, $14.20 and $17.82; average earnings per week, 30c. and 33c.; number of working hours first five days, 9 for carpenters, 10 for mill men; number on Saturday, 9; wages paid fortnightly; average number of days idle per member during year, carpenters three months, mill men 18 days; general cause of idleness, no work for carpenters, holidays for mill men; total number (union and non-union) employed at trade in locality, 150; difference in wages and hours of labour of those engaged at trade in locality, union 9 hours, non-union 10 hours, mill men 10 hours; cash benefits, sickness, 50c. per week; death, $200; no special work for members; body registered. President, David Mather, Charon Street; Corresponding Secretary, George Vogt, 118 Ahrens Street West; meets first and third Fridays in month.

Name,—Cigarmakers' International Union, No. 422. Organized July 24, 1899; total membership, 24; average earnings per week, $11.00; average earnings per hour, 25c.; number of working hours first five days, 8; number on Saturday, 4; wages paid weekly; average number of days idle per member during year, 20; general cause of idleness, damp weather or slackness of trade; total number union and non-union) employed at trade in locality, male, 34; female, 6; difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization, non-union work 10 hours per day and receive from $5 per thousand up; union men receive $7 per thousand up, and work 8 hours per day; cash benefits, lack of employment, $3 per week; sickness, $5 per week; death, $50 to $550; out of work benefits, $3 per week; loan to travel in search

of employment, $20; no special work for members. President, Leo. Sobisch, Waterloo, Ont.; Corresponding Secretary, Steve Wellheuser, 22 Troy Street, Berlin; meets second Tuesday in each month.

Name,—Boot and Shoe Workers' Union, No. 206. Organized March 1, 1900; total membership, 76; average earnings per week, male, $10.80; female, $9; average earnings per hour, male, 18c.; female, 15c.; number of working hours first five days, 50; number on Saturday, 7½; wages paid fortnightly; average number of days idle per member during year, 18; general cause of idleness, stock taking; total number (union and non-union) employed at trade in locality, male, 300; female, 70; no difference in wages and hours of those engaged at trade in locality between members and non-members of organization; cash benefits, sickness, $6 per week; death, $50 to $100; out of work benefits, $1.25 per week. President, William Harlock, 105 Charles Street; Corresponding Secretary, H. W. Oliver, 130 Louisa Street; meets second and fourth Fridays in month.

Name,—International Hodcarriers' and Builders' Labourers' Union, No. 160. Organized July, 1905; total membership, 37; average earnings per week, $15.36; average earnings per hour, from 28c. to 32c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; average number of days idle per member during year, mostly all winter; general cause of idleness, no work; total number (union and non-union) employed at trade in locality, 37; no non-union men employed; we carry an insurance; no other cash benefits. President, H. Podens, Waterloo Street; Corresponding Secretary, Geo. Hoffman, 58 Homewood Avenue; meets first and third Wednesdays in month.

Name,—Federal Labour Union, No. 17. Organized April 16, 1901; total membership, 47; average earnings per week, $9; average earnings per hour, 18c.; number of working hours first five days, 50; number on Saturday, 9; wages paid fortnightly; average number of days idle per member during year, 100; general cause of idleness, winter weather; difference in wages and hours of labour between members and non-members, a few cents per hour with preference. President, F. Ackerknecht, 36 Frederick Street; Corresponding Secretary, A. Wildfong, 30 Richmond Avenue; meets first and third Thursday in month.

Name,—Federated Association of Letter Carriers, No. 20. Total membership, 10; average earnings per week, $12.50; average earnings per hour, 22½c.; number of working hours first five days, 45; number on Saturday, 9; wages paid fortnightly; no idle days; total number (union and non-union) employed at calling in locality, 10; no difference in wages or hours between members and non-members; body registered. President, W. Witzel, General Delivery, Berlin; Corresponding Secretary, W. H. Halliwell, General Delivery, Berlin; no regular night of meeting.

Name.—Musicians' Protective Association. Organized 1906; total membership, male, 88; female, 2. President, E. C. Schultz, 26 Brubacker Street, Berlin; Corresponding Secretary, G. A. Albrecht, 151 Wellington Street, Berlin; meets first Tuesday every second month.

Name,—United Association of Plumbers and Steamfitters, No. 527. Organized Feb. 18, 1911; total membership, 10; average earnings per week, $16.50; average earnings per hour, 30c.; number of working hours first five days, 50; number on Saturday, 5; wages paid weekly and fortnightly; general cause of idleness, no work; total number (union and non-union) employed at trade in locality, 15; no difference in wages or hours between members and non-members; cash benefits, sickness, $5 per week; death, $100; superannuation, 20 years and under 25, $300;

25 and under 30, $400; 30 and over, $500. President, Geo. Zimmerman, Waterloo; Corresponding Secretary, E. R. Reitz, 57 William Street, Berlin.

Name,—Journeymen Tailors' Union of America, No. 264. Organized 1901; total membership, male, 8; female, 7; average earnings per week, male, $12; female, $9; average earnings per hour, male, 20c.; female, 15c.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly; average number of days idle per member during year, 40; general cause of idleness, slack season; total number (union and non-union) employed at trade in locality, male, 13; female, 10; difference in wages and hours of those engaged at trade in locality between members and non-members, about 15 per cent.; cash benefits, sickness, $5 per week; death, $100; body incorporated and registered. President, George Filsinger, 79 Ahrens Street; Corresponding Secretary, A. H. Duench, 42 Cedar Street North; meets first Tuesday in month.

Blenheim.

Name,—International Brotherhood of Maintenance of Ways Employes, No. 502. Organized 1907; total membership, 105; average earnings per week, $9.65; average earnings per hour, 16½c.; number of working hours first five days, 10; number on Saturday, 10; wages paid monthly; no idle days; difference in wages and hours of those engaged at calling in locality, G. T. R., non-union, $1.50; Pere Marquette, union, $1.65; no special work for members; body incorporated and registered. President, Arthur Mansell, Blenheim P.O., Ont.; Corresponding Secretary, Stephen Tilley, 48 Park Avenue West, Chatham; meets at call of President.

Bowmanville.

Name,—Glove Workers' International Union of America, No. 43. Total membership, male, 6; female, 6; average earnings per week, male, $14; female, $9; number of working hours first five days, 42½; number on Saturday, 4; wages paid weekly; no idle days; difference in wages and hours of labour between members and non-members, non-union, 55 hours; wages same; body incorporated and registered. President, W. Pearl; Corresponding Secretary, J. Declute; meets second Friday in month.

Brantford.

Name,—Journeymen Barbers' International Union of America, No. 298. Organized May 28, 1901; total membership, 27; average earnings per week, $13; average earnings per hour, 20c.; number of working hours first five days, 50; number on Saturday, 15; wages paid weekly; average number of days idle per member per year, legal holidays; total number (union and non-union) employed at trade in locality, 45; all union; cash benefits, sickness, $5 per week; death, $75 to $500; no special work for members. President, James Rice, 5 George Street; Corresponding Secretary, Ernest Deagle, 395 Colborne Street; meets last Monday in each month.

Name,—Bartenders' International League, No. 182. Organized May 17, 1899; total membership, 29; average earnings per week, $15; number of working hours first five days, 50 to 60; number on Saturday, 10 to 12; wages paid weekly; total number (union and non-union) employed at trade in locality, 28; cash benefits, sickness, $3 per week; death, $50; body incorporated and registered. President, Denis Kavanagh, "Bodega" Hotel; Corresponding Secretary, Chas. Benwell, "Benwell" Hotel; meets last Sunday afternoon in month.

Name,—Bricklayers', Masons' and Plasterers' International Union, No. 9. Organized March 31, 1899; total membership, 103; average earnings per week, $21.12; average earnings per hour, 48c.; number of working hours first five days, 10; number on Saturday, 4; wages paid weekly; average number of days idle per member during year, 90; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 110; difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization, union, 48c. to 50c.; non-union, 25c. to 35c.; cash benefits, death, $50 to $200; no special work for members. President, A. Fischer, Grand View P.O.; Corresponding Secretary, B. E. Pearcey, 74½ Erin Avenue; meets alternate Thursdays from April 18th.

Name,—Amalgamated Society of Carpenters and Joiners, No. 783. Organized June 4, 1860; total membership, 28; average earnings per week, $13; average earnings per hour, 32c.; number of working hours first five days, 10; number on Saturday, 5 in summer, 9 in winter; wages paid weekly; average number of days idle per member during year, 50; general cause of idleness, bad weather and disinclination to have work done in winter; total number (union and non-union) employed at trade in locality, 150; difference in wages and hours of those engaged at trade in locality between members and non-members of organization, 5c. per hour less to non-members; hours the same; cash benefits, sickness, $3 per week; death, $60; superannuation, $1.75 per week; out of work benefits, $2.50 per week; tool insurance up to $75; accident benefit up to $500; no special work for members; body registered. President, Charles McInness, 23 North Park Street, Brantford; Corresponding Secretary, J. W. Harris, 9 Young Street, Brantford; meets every alternate Monday; year commencing Jan. 8, 1912.

Name,—United Brotherhood of Carpenters and Joiners of America, No. 498. Organized Feb. 21, 1900; total membership, 12; average earnings per week, $16.50; average earnings per hour, 30c.; number of working hours first five days, 50; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 60; general cause of idleness, weather; total number (union and non-union) employed at trade in locality, 200; difference in wages and hours of labour of those engaged in trade in locality, between members and non-members of organization, 50c.; cash benefits, death, $100 to $300; no special work for members; body incorporated and registered. President, Albert G. Brown, Grand View P.O., Brantford, Ont.; Corresponding Secretary, Joseph Swift, 292 Park Avenue, Brantford; meets second and fourth Tuesdays.

Name,—Canadian Association of Stationary Engineers, No. 4. Organized June 27, 1889; total membership, 5; average earnings per week, $12; average earnings per hour, 20c.; number of working hours first five days, 50; number on Saturday, 5; wages paid weekly and fortnightly; average number of days idle per member during year, holidays; general cause of idleness, stock taking; total number (union and non-union) employed at trade in locality, 22; no difference in wages or hours between members and non-members; body incorporated and registered. President, A. Ames, 159 Chatham Street; Corresponding Secretary, Joseph Ogle, 73 Richmond Street; meets second and fourth Fridays in month.

Name,—Federated Association of Letter Carriers, No. 13. Organized 1901; total membership, 19; average earnings per week, $12 to $16.50; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; no idle days; total number (union and non-union) employed at calling in locality, 19; death benefits, $50 to $1,000. President, Frank Jones, 36 Gray Street; Corresponding Secretary, L. E. Smith, 10 Pearl Street; meets first Saturday in month.

Name,—International Moulders' Union, No. 29. Organized 1852; total membership, 300; average earnings per week, $16.50; average earnings per hour 27½c.; number of working hours first five days, 50; number on Saturday, 9; wages paid fortnightly; no idle days; total number (union and non-union) employed at trade in locality, 400; difference in wages and hours of those engaged at trade in locality between members and non-members of organization, 25 per cent.; cash benefits, lack of employment, dues paid; sickness, $5.40 per week; death, $200. President, John Symons; Corresponding Secretary, C. J. Crowley, 471 Colborne Street; meets alternate Mondays.

Name,—Brotherhood of Painters, Decorators and Paperhangers of America, No. 313. Organized 1898; total membership, 10; average earnings per week, $10.80 to $11.84; average earnings per hour 20c. to 22c.; number of working hours first five days, 45; number on Saturday, 9; wages paid weekly; average number of days idle per member per year, 65; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 65; difference in wages or hours between members and non-members, non-union receive from 5c. to 10c. per hour less than union; death benefit, $250; body incorporated and registered. President, Thos. Hill, 9 Marlborough Street; Corresponding Secretary, C. H. Jones, 93 Arthur Street: meets first Monday in month.

Name,—Operative Plasterers' International Associaion. No. 164. Organized 1900; total membership, 11; average earnings per week, $15; average earnings per hour, 45; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 90; general cause of idleness, cold weather; total number (union and non-union) employed at trade in locality, 24; no difference in wages or hours of labour between members and non-members; cash benefits, death, $200; no special work for members; body incorporated and registered. President, R. G. Gilderstone, 144 Northumberland Street; Corresponding Secretary, H. Perrin, 7 Holme Street; meets second and last Thursday.

Name,—United Association of Plumbers, Gas and Steam Fitters, No. 186. Organized Oct. 25, 1899; total membership, 24; average earnings per week, $18.75; average earnings per hour, 37½c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 14;; general cause of idleness, lack of work; total number (union and non-union) employed at trade in locality, 27; difference in wages and hours of labour between members and non-members, non-union men work 10 hours per day and receive about 27½c. per hour; cash benefits, sickness, $5 per week; death, $100; superannuation, 20 consecutive years, $300; 25 years full membership and under 30, $400; 30 years full membership and over, $500; special work for members, library in connection with local, only such books as deal with our trade. President, James Ballantyne, 73 Brant Street; Corresponding Secretary, James W. Croucher, 51 Church Street; meets first and third Tuesdays in month.

Name,—Journeymen Tailors' Union of America, No. 117. Organized 1890; total membership, male, 35; female, 27; average earnings per week, male, $14.50; female, $8; average earnings per hour, male 25c.; female, 18c.; number of working hours first five days, 50; number on Saturday, 10; wages paid weekly; average number of days idle per member during year, 80; general cause of idleness, slack trade; total number (union and non-union) employed at trade in locality, male, 37; female, 30; difference in wages and hours of those engaged at trade in locality,

about 3½ per cent.: cash benefits, sickness, $5 per week; death, $100; no special work for members. President, Richard Mowbray, 118 Albion Street; Corresponding Secretary, Belle Sisson, 141 Colborne Street; meets fourth Tuesday in month.

Name,—International Typographical Union, No. 378. Organized June, 1900; total membership, 30; average earnings per week, $14.50; average earnings per hour, 30c.; number of working hours first five days, 42½; number on Saturday, 5½; wages paid weekly; total number (union and non-union) employed at trade in locality, 33; difference in wages and hours of labour between members and non-members, non-union men run shops of their own; cash benefits, death, $75 to $400; superannuation, $5 per week; special work for members, Internationl technical course (optional). President, W. D. Reeves, 109 Terrace Hill Street; Corresponding Secretary, Ira D. Scruton, 112 Sydenham Street; meets fourth Wednesday in month.

BRIDGEBURG.

Name,—United Brotherhood of Carpenters and Joiners of America, No. 1,850. Organized July 3, 1911; total membership, 24; average earnings per week, $18.90; average earnings per hour, 35c.; number of working hours first five days, 45; number on Saturday, 9; wages paid weekly; average number of days idle per member during year, 60; general cause of idleness, bad weather; total number (union and non-union) employed at trade in locality, 30; difference in wages and hours of labour of those engaged at trade in locality, between members and non-members, 5c. to 10c.; cash benefits, death, $100 to $200; total disability, $100 to $400. President, Wm. Armstrong; Corresponding Secretary, Hugh Brown, Bridgeburg; meets first and third Mondays in month.

Name,—Brotherhood of Railway Carmen, No. 10. Total membership, 40; average earnings per week, $14.40; average earnings per hour, 18c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 40; no difference between members and non-members; cash benefits, sickness, 50c. per day; death, insurance with railroad; superannuation after 65 years of age. Corresponding Secretary, A. Merryweather, Bridgeburg.

Name,—Brotherhood of Locomotive Engineers, No. 679. Organized May 24, 1905; total membership, 19; average earnings per week, $32.76; average earnings per hour, 39c.; number of working hours first five days, 60; number on Saturday, 12; wages paid monthly; average number of days idle per member during year, 12; total number (union and non-union) employed at trade in locality, 19; no difference in wages or hours of those engaged at trade in locality; cash benefits, death, $1,500; no special work for members; body incorporated. President, Richard Walsh, 1892 Niagara Street, Buffalo, N. Y.; Corresponding Secretary, M. R. Harvey, Bridgeburg, Ontario; meets first Wednesday and second Tuesday in month.

BROCKVILLE.

Name,—Journeymen Barbers' International Union, No. 387. Organized March 26, 1902; total membership, 18; average earnings per week, $12; number of working hours first five days, 55; number on Saturday, 14; wages paid weekly; total number (union and non-union) employed at trade in locality, 19; cash benefits, sickness, $5 per week; death, $75 to $500. President, Thomas Goodison, 75 Church Street; Corresponding Secretary, Fred. J. Clutterbuck, 7 King Street West; meets last Monday in month.

Name,—United Brotherhood of Carpenters and Joiners, No. 799. Total membership 40; average earnings per week, $18; average earnings per hour, 33⅓c.; number of working hours first five days, 45; number on Saturday, 9; wages paid weekly; total number (union and non-union) employed at trade in locality, 75; difference in wages and hours between members and non-members, non-union receive 25c. per day; death benefit, $200; body incorporated and registered. President, L. B. Kerr, 33 King Street East; Corresponding Secretary, N. Young; meets Thursday evenings.

Name,—Brotherhood of Locomotive Engineers, No. 118. Organized 1864; total membership, 48; average earnings per week, $25; wages paid monthly; no difference in wages or hours between members and non-members; cash benefits, sickness, $3.50 per week by company, $3 per week by society; death, from $750 to $4,000 by society; $350 to $2,000 by company, superannuation, the company pays a premium of from $20 to $40, according to length of service. President, E. Mortimer, Brockville; Corresponding Secretary, R. Wardrop, 39 Daniel Street, Brockville; meets every Tuesday in month.

Name,—International Moulders' Union of North America, No. 329. Organized 1909; total membership, 10; average earnings per week $12; average earnings per hour, 24c. and 27c.; number of working hours first five days, 47½; number on Saturday, 9½; wages paid fortnightly; total number (union and non-union) employed at trade in locality, 70; no difference in wages or hours between members and non-members; body incorporated and registered. President, John Manahan; Corresponding Secretary, Chas. Gochie, 122 Abbott Street; meets first and third Tuesdays in month.

Name,—Journeymen Tailors' Union of North America, No. 262. Organized 1901; total membership, male, 11; female, 9; average earnings per week, male, $10; female, $6 to $7; average earnings per hour, male, 17c.; female, 12c.; number of working hours first five days, 45; number on Saturday, 9; wages paid weekly; average number of days idle per member during year, 30; general cause of idleness, slackness of trade; total number (union and non-union) employed at trade in locality, male, 15; female, 20; difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization, 10 per cent.; cash benefits, sickness, $5 per week; death, $100. President, E. Enright, Church Street; Corresponding Secretary, A. S. Hamilton, 24 John Street; meets first Monday in month.

Carleton Place.

Name,—International Brotherhood of Blacksmiths and Helpers, No. 424. Total membership, 15; average earnings per week, $14; average earnings per hour, 25c.; number of working hours first five days, 45; number on Saturday, 5; wages paid monthly; average number of days idle per member during year, 15; general cause of idleness, reduction of expenses; total number (union and non-union) employed at trade in locality, 25. President, S. Hale, Carleton Place; Corresponding Secretary, R. G. Curtis, Box 224, Carleton Place; meets last Saturday in month.

Name,—International Association of Machinists, No. 211. Organized 1899; total membership, 52; average earnings per week, $16.50; average earnings per hour, 33c.; number of working hours first five days, 45; number on Saturday, 5; wages paid monthly; average number of days idle per member during year, 13; general cause of idleness, holidays; total number (union and non-union) employed at trade in locality, 60; apprentices, 8; no difference in wages or hours except

apprentices between members and non-members of organization; cash benefits, sick dues; death, $75 to $250; no special work for members. President, John Dunfield, Carleton Place; Corresponding Secretary, J. H. McFadden, Box 326, Carleton Place; meets second and fourth Thursdays in month.

Name,—International Brotherhood of Maintenance of Way Employes, No. 222. Total membership, 95; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 125; no difference in wages or hours between members and non-members. President, James McLean, Carleton Place; Corresponding Secretary, I. P. Steele, Box 313, Carleton Place; meets last Saturday in month.

Name,—Metal Polishers', Buffers', Platers' and Brass Workers' International Union of North America, No. 96. Organized March 1, 1909; total membership, 14; average earnings per week, $19.80 to $20; average earnings per hour, 33c.; number of working hours first five days, 50; number on Saturday, 10 (July and August 5); wages paid fortnightly; no idle days; total number (union and non-union) employed at trade in locality, 14; all are members of organization; cash benefits, death, $50 to $200; out of work benefits, dues remitted; body incorporated. President, E. J. Cunningham, Carleton Place; Corresponding Secretary, A. P. Williamson, Box 168, Carleton Place; meets first and third Thursdays in month.

Name,—International Moulders' Union, No. 362. Organized June 10, 1901; total membership, 23; average earnings per week, $20; average earnings per hour, 35.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly; no idle days; total number (union and non-union) employed at trade in locality, 28; no difference in wages or hours of those engaged at trade in locality; cash benefits, sickness, $5.40 per week; death, $100; out of work benefits, 40c. per week; no special work for members. President, John G. McPhail, Carleton Place; Corresponding Secretary, J. J. Carson, Box 292, Carleton Place; meets third Thursday in month.

Name,—Brotherhood of Railway Carmen, No. 229. Organized Jan. 6, 1903; total membership, 15; average earnings per week, $12.50; average earnings per hour, 25c.; number of working hours first five days, 45; number on Saturday, 5; wages paid monthly; total number (union and non-union) employed at calling in locality, 18. President, Thomas Carson, Carleton Place; Corresponding Secretary, James Richards, Carleton Place; meets fourth Thursday in month.

Name,—Stove Mounters' International Union, No. 78. Organized March 31, 1905; total membership, 13; average earnings per week, $18; average earnings per hour, 30c.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly; total number (union and non-union) employed at trade in locality, 18; no difference in wages or hours between members and non-members; cash benefits, death, $100; out of work benefits, dues remitted; body incorporated. President, J. C. Beck, Carleton Place; Corresponding Secretary, W. J. Saunders, Box 301; meets second and fourth Thursdays in month.

Chapleau.

Name,—Brotherhood of Locomotive Engineers, Sub-Division No. 319. Organized October 2, 1886; total membership, 50; average earnings per week, mileage basis; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 50; no difference in wages or hours of those engaged at calling in locality; cash benefits, sickness, accident policy; death,

insurance; no special work for members; body incorporated and registered. President, P. Downey, Chapleau; Corresponding Secretary, B. Warner, Box 158, Chapleau; meets every Monday at 2 p.m.

Name,—Brotherhood Locomotive Firemen and Enginemen (Snowdrift Lodge), No. 321. Organized 1886; total membership, 72; average earnings per week, mileage basis; average earnings per hour, mileage basis; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 60; no difference in wages or hours of labour between members and non-members; cash benefits, death, insurance; no special work for members. President, A. St. Amand, Chapleau; Corresponding Secretary, A. Clifton, Box 114, Chapleau; meets every Wednesday in month.

Name,—International Association of Machinists, No. 535. Organized January, 1909; total membership, 20; average earnings per week, $25; average earnings per hour, 39c.; number of working hours first five days, 50; number on Saturday, 5; wages paid monthly; no idle days: total number (union and non-union) employed at trade in locality, 20; no difference in wages or hours of labour between members and non-members; cash benefits, death, $50 to $200; out of work benefits, dues remitted; no special work for members. President, J. A. Dion, Box 57, Chapleau: Corresponding Secretary, V. Beardmore, Box 57, Chapleau; meets second and fourth Wednesdays in month.

Name,—International Brotherhood of Maintenance of Way Employees, No. 237. Organized May 15, 1892; total membership, ; average earnings per week, $11.40; average earnings per hour, 19c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days: total number (union and non-union) employed at calling in locality, 106; difference in wages or hours between members and non-members, non-union receive 1½ c. per hour less than union: hours the same; death benefit, amount of insurance; body incorporated and registered. President, R. J. O'Hearn, Chapleau; Corresponding Secretary, N. Darby, Woman River, Ont.: meets last Saturday in month.

Chatham.

Name,—Canadian Association of Stationary Engineers, No. 21. Total membership, 27; average earnings per week, $13.50; average earnings per hour, 22½c.; number of working hours first five days, 50; number on Saturday, 9; wages paid fortnightly; no idle days; total number (union and non-union) employed at trade in locality, 33; body incorporated. President, S. Keats, Witherspoon Street; Corresponding Secretary, Wm. Congdon, Dover Street; meets every Thursday in Month.

Name,—United Garment Workers, No. 44. Organized Feb. 28, 1910; total membership, Male, 1; female, 33; average earnings per week, female, $5 to $10; number of working hours first five days, 40; number on Saturday, 4½: wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, male, 2; female, 35; all are members of organization: special work for members, piano furnished for use of members. President, Myrtle Tyndall, Chatham; Corresponding Secretary, Edith Kennedy, Chatham: meets last Tuesday in month.

Name,—International Typographical Union, No. 421. Organized November, 1909; total membership, 15; average earnings per week, $13; average earnings per hour, 27c.: number of working hours first five days, 40; number on Saturday, 8;

wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 25; difference in wages and hours of labour between members and non-members of organization, union and non-union receive about the same pay; cash benefits, death, $75 to $100; body incorporated and registered. President, A. J. Cartier, Chatham; Corresponding Secretary, Andrew Riddell, Taylor Avenue, Chatham; meets first Monday in month.

Coatsworth.

Name,—Order of Railroad Telegraphers, No. 39. Organized 1880: total membership, 38; average earnings per week; $15; average earnings per hour, 21c.: number of working hours first five days, 60; number on Saturday, 12; Sunday 1 to 12 hours; wages paid monthly; total number (union and non-union) employed at calling in locality, 44: no difference in wages or hours between members and non-members; cash benefits, death, amount insured; body incorporated and registered. President, W. A. Knister, Coatsworth, Ont.; Corresponding Secretary, F. D. Keeler, 87 Cass Avenue, Grand Rapids, Mich.; meets at call of Chairman.

Cobalt.

Name,—Western Federation of Miners, No. 146. Organized March 24, 1906: total membership, 1,400; average earnings per week, $12 to $22; average earnings per hour, 24c. to 47c.; number of working hours first five days, 47½; number on Saturday, 8½; wages paid monthly; average number of days idle per member during year, uncertain: general cause of idleness, overflow of labour power; total number (union and non-union) employed at calling in locality, 2,300; difference in wages between members and non-members, from 25c. to $1 per day; cash benefits, sickness, $7 per week; death, $50; reading room and gymnasium for use of members. Acting President M. O'Farrell, Box 446, Cobalt; Corresponding Secretary, A. N. Gauthier, Box 446, Cobalt; meets Sunday, 2 p.m.

Name,—Order of Railroad Telegraphers, Div. No. 99. Organized July, 1907; total membership, 54; average earnings per week varies; average earnings per hour varies; number of working hours first five days, 60; number on Saturday 12; wages paid monthly; average number of days idle per member during year, 14; general cause of idleness, holidays; total number (union and non-union) employed at calling in locality, 62; no difference in wages or hours between members and non-members; body incorporated and registered. President, J. B. Flagler, Englehart; meets first Sunday every second month.

Cobourg.

Name,—International Moulders' Union, No. 189. Organized 1881; total membership, 52; average earnings per week, $24; average earnings per hour, 45c.: number of working hours first five days, 50; number on Saturday, 10: wages paid fortnightly; average number of days idle per member during year, 90; general cause of idleness, depression in trade; total number (union and non-union) employed at trade in locality, 52; cash benefits, sickness, $5.40 per week; death, $100 to $2,000; out of work benefits, dues remitted. President, Robt. Brant, Port Hope; Corresponding Secretary, Reuben Bennett, Port Hope; meets first and third Mondays in month.

Colborne.

Name,—International Brotherhood of Maintenance of Way Employees (C.N.R.) No. 280. Total membership, 40; average earnings per week, foreman, $14.80; labourers, $10.20; average earnings per hour, foreman 23c.; labourers, 17c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; difference in wages and hours of those engaged at calling in locality between members and non-members, no difference in hours; union men receive 20c. a day more. President, G. H. Nason, Cobourg; Corresponding Secretary, H. Hennessy, Colborne; meets third Friday in month.

Collingwood.

Name,—Journeymen Barbers' International Union, No.528. Organized May 23, 1903; total membership, 12; average earnings per week, $12; average earnings per hour, 19c.; number of working hours first five days, 50; number on Saturday, 13; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 16; cash benefits, sickness, $5 per week; death, $75 to $500. President, Leonard Fryer, Huron Street; Corresponding Secretary, Fred. L. Bollen, Box 536, Collingwood; meets first and third Mondays.

Name,—Bricklayers' and Masons' International Union, No. 19. Organized 1902; total membership, 12; average earnings per hour, 40c.; number of working hours first five days, 45; number on Saturday, 9; wages paid fortnightly; average number of days idle per member during year, 175 to 200; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 15; difference in wages and hours of labour between members and non-members, non-union work 10 to 11 hours per day, and their wages run from $1.50 to $2.50 per day; cash benefit, death, $100 to $300. President, John Gilham, Box 777, Collingwood; Corresponding Secretary, Willis Court, Box 797, Collingwood; meets third Wednesday in month.

Name,—Amalgamated Society of Carpenters and Joiners. Organized, April, 1911; total membership, 11; average earnings per week, $14; average earnings per hour, 27½c.; number of working hours first five days, 59; number on Saturday, 9; wages paid fortnightly; average number of days idle per member during year, well employed; total number (union and non-union) employed at trade in locality, 60; difference in wages between members and non-members, 5c. to 10c. per hour; cash benefits, sickness, $3.00 per week; death $60; death of member's wife, $25; superannuation, $2 per week at the age of 60; out of work benefit, $2.50 per week; body registered. President, S. Brooks, Collingwood, P. O.; Corresponding Secretary, R. Fleetham, Box 420, Collingwood; meets Saturday.

Name,—Labourers' Protective Union, No. 14,106. Organized Sept. 8, 1911; total membership, 20; average earnings per week, $10.50; average earnings per hour, 25c.; number of working hours first five days, 45; number on Saturday, 9; wages paid fortnightly; average number of days idle per number during year, 150; general cause of idleness, weather conditions; difference in wages between members and non-members, union 25c. per hour; non-union 17½c. per hour; no special work for members. President, Robert McGinnie, Robinson Street, Collingwood; Corresponding Secretary, Robert Boyce, Sixth Street, Collingwood; meets second and fourth Fridays in month.

Collingwood.

Name,—International Longshoremens' Association, No. 476. Organized August 27, 1892; total membership, 10; average earnings per week, $12.50; average earnings per hour, 25c.; number of working hours first five days, 50; number on Saturday, 10; wages paid when job completed; average number of days idle per member during year, 120; general cause of idleness, close of navigation; total number (union and non-union) employed at calling in locality, varies from 10 to 30; difference in wages and hours of labour of those engaged at calling in locality, from 5c. to 10c. per hour; no special work for members; body incorporated and registered. President, W. C. Nutt, Ste. Marie Street; Corresponding Secretary, William Turnbull, Napier Street; meets first and third Thursday in month.

Name,—Amalgamated Society of Engineers. Total membership, 22; average earnings per week, $16.50; average earnings per hour, 27½c.; number of working hours first five days, 50; number on Saturday, three summer months, 5; nine winter months, 10; wages paid fortnightly; cash benefits, sickness, $2.50 per week; death, $60; superannuation, $2.50 per week; out of work benefit, $2.50 per week. President, Arthur Fairhurst, 21 Ste. Marie Street; Corresponding Secretary, Thos. Kelly, Hurontario Street, Collingwood; meets Saturday.

Cornwall.

Name,—Journeymen Tailors' Union of America, No. 5,679. Organized July 7, 1902; total membership, 10; average earnings per week, $12; average earnings per hour, 20c.; number of working hours first five days, 50; number on Saturday, 10; wages paid weekly; average number of days idle per member during year, 30; general cause of idleness, slack time; total number (union and non-union) employed at trade in locality, male, 13; female, 10; cash benefits, sickness, $5 per week; death, $100; no special work for members; body incorporated and registered. President, J. Delbeck, First Street; Corresponding Secretary, Hugh McDonald, Pitt Street; meets first Monday in month.

Crookston.

Name,—Journeymen Stonecutters' Association of North America. Corresponding Secretary, Frederick McCauley, Crookston.

Deseronto.

Name,—Order of Railroad Telegraphers, Canadian Northern Division No. 43. Organized July 22, 1910; total membership, 23; average earnings per week, $14; number of working hours first five days, 60; number on Saturday, 12; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, male, 29; female, 2; no difference between members and non-members of organization; no special work for members. President, S. Thomas, Tamworth; Corresponding Secretary, R. A. McKeown, Box 263, Deseronto; meets annually.

Dundas.

Name,—International Moulders' Union, No. 269. Organized Feb. 17, 1900; total membership, 25; average earnings per week; $15; average earnings per hour,

28c.; number of working hours first five days, 50; number on Saturday, 5; wages paid fortnightly; total number (union and non-union) employed at trade in locality, 27; cash benefits, sickness, $5.40 per week; death, $100 to $200; out of work benefits, dues remitted; no special work for members. President, M. J. Dunn, Box 117, Dundas; Corresponding Secretary, George S. Stutt, Box 239, Dundas; meets third Monday in month.

Elk Lake.

Name,—Western Federation of Miners, No. 140. Organized Jan. 10, 1909; total membership, 57; average earnings per week, $20; average earnings per hour, 35c.; number of working hours first five days, 45; number on Saturday, 9; wages paid monthly; average number of days idle per member during year, 60; general cause of idleness, mines cease operations; total number (union and non-union) employed at calling in locality, 70; cash benefits, sickness, $7 per week; death, $50; body incorporated and registered. President, F. G. Macleod, Box 348: Corresponding Secretary, L. Wyatt, Box 348, Elk Lake; meets Sunday.

Elmira.

Name,—Amalgamated Woodworkers' International Union of America, No. 129. Organized August 14, 1903; total membership, 25; average earnings per week, $11.50; average earnings per hour, 20c.; number of working hours first five days, 50; number on Saturday, 5; wages paid fortnightly; no idle days; total number (union and non-union) employed at trade in locality, 120; no difference in wages or hours between members and non-members; body incorporated and registered. President, Thomas Dillon, South Street; Corresponding Secretary. S. B. Frey, Park Avenue, Elmira; meets last Tuesday in month.

Espanola.

Name,—International Brotherhood of Paper Makers, No. 156. Organized Sept. 2, 1911; total membership, 21; average earnings per week, $16.80; average earnings per hour, 35c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; no idle days; total number (union and non-union) employed at trade in locality, 21; death benefits, $50. President, Robert Craig, Espanola; Corresponding Secretary, H. H. Brant, Espanola; meets second and fourth Sundays in month.

Essex.

Name,—International Brotherhood of Maintenance of Ways Employees (Townsend Lodge), No. 312. Organized January 17, 1907; total membership, 30; average earnings per week, $12; average earnings per hour, 17c.; number of working hours first five days, 50; number on Saturday, 9; wages paid monthly; average number of days idle per member during year, 50; general cause of idleness, slack work in winter months; total number (union and non-union) employed at calling in locality, 30; no difference in wages and hours between members and non-members of organization; no special work for members. President, A. B. Lowe, 3,900 Olive Street, St. Louis, Mo.; Corresponding Secretary, Samuel J. Pegg, 3,900 Olive Street, St. Louis, Mo., meets second and fourth Wednesdays in month.

Fort Frances.

Name,—International Brotherhood of Maintenance of Way Employees, No. 313. Organized 1903; total membership, 100; average earnings per week, $14.29 to $14.60; average earnings per hour, 25c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; body incorporated and registered. President, A. R. Revill, Mine Centre; Corresponding Secretary, F. McNarney, La Vallee; Nights of meeting, no special day.

Fort William.

Name,—Bartenders' International League of America, No. 761. Organized June, 1902; total membership, 44; average earnings per week, $20; average earnings per hour, 40c.; number of working hours first five days, 42½; number on Saturday, 6½; wages paid monthly; total number (union and non-union)) employed at calling in locality, 44; no difference in wages or hours between members and non-members; cash benefits, sickness, $5 per week; death, $50; body incorporated and registered. President, Robert Brebner, 385 Simpson Street; Corresponding Secretary, Roy Carson, 215 Bethune Street; meets every alternate Sunday in month.

Name,—International Brotherhood of Boilermakers and Iron Ship Builders and Helpers of America, No. 505. Organized Sept. 11, 1907; total membership, 20; average earnings per week, $22; average earnings per hour, 44c.; number of working hours first five days, 45; number on Saturday, 5; wages paid monthly; average number of days idle per member during year, 30; general cause of idleness, reduction of expenses; total number (union and non-union) employed at trade in locality, 50; difference in wages and hours of labour of those engaged at trade in locality, between members and non-members of organization, union workers 50 hours a week, 44c. per hour; non-union 29½c. to 33c.; 60 hours a week; cash benefits, death, $100; out of work benefits, dues remitted; body incorporated and registered. President, Edward Thompson, 411 Prince Arthur Boulevard; Corresponding Secretary, Frederick Stafford, 420 Mary Street, Fort William; meets first and third Fridays in month.

Name,—Bricklayers', Masons' and Plasterers' International Union, No. 25. Organized February, 1903; total membership, 82; average earnings per week; $20; number of workings hours first five days, 45; number on Saturday, 9; wages paid fortnightly; average number of days idle per member during year, 120; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 82; death benefits, $50 to $250. President, S. Hartley, 34 Shuniah Road, Port Arthur; Corresponding Secretary, Arthur Scarlett, 107 Empire Avenue, Port Arthur; meets second and fourth Mondays in month.

Name,—International Association of Bridge and Structural Iron Workers, No. 53. Organized Jan. 31, 1903; total membership, 30; average earnings per hour, 50c.; number of working hours first five days, 45; number on Saturday, 9; total number (union and non-union) employed at trade in locality, 60; cash benefits, death, $100. President, W. J. Mason, 728 Harold Street; Corresponding Secretary, R. Young, Box 182, Fort William; meets first and third Fridays in month.

Name,—Amalgamated Society of Carpenters and Joiners, No. 787. Organized March 20, 1908; total membership, 22; average earnings per week, $24;

average earnings per hour, 40c.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly average number of days idle per member during year, 50; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 200; no difference in wages or hours of labour of those engaged at trade in locality; cash benefits, lack of employment, $2.50 per week; sickness, $3 per week; death, $60; superannuation, $2 per week; total disablement by accident, $500; body incorporated and registered. President, H. Edwards, 134 Franklin Street South; Corresponding Secretary, J. H. Dutton, 407 Vickars Street; meets first and third Monday in month.

Name,—Order of Railway Conductors, No. 286. Total membership, 65; average earnings per week, $35; wages paid monthly; no idle days; no difference in wages or hours between members and non-members; body incorporated and registered. President, D. H. Beaton, 346 North Syndicate Street; Corresponding Secretary, A. B. Marcotte, 439 Wiley Street, Fort William; meets second and fourth Sundays in month.

Name,—Brotherhood of Locomotive Engineers, No. 243. Organized 1884; total membership, 50; average earnings per week, $30; average earnings per hour, 46½c.; number of working hours first five days mileage basis; number on Saturday, mileage basis; wages paid monthly; total number (union and non-union) employed at calling in locality, 75; no difference in wages or hours between members and non-members; cash benefits, death, amount of insurance; superannuation, 10 per cent. of last year's earnings; body incorporated and registered. President, H. Mills, 231 Pruden Street; Corresponding Secretary, W. G. Smyth, 407 Prince Arthur Boulevard; meets second and fourth Thursdays in month.

Name,—Brotherhood of Locomotive Firemen and Enginemen, No. 308; Organized Aug. 17, 1911; total membership, 48; average earnings per week, $20; average earnings per hour, 25c.: wages paid monthly; total number (union and non-union) employed at calling in locality, 48; no difference in wages or hours between members and non-members; body incorporated and registered. President, James Ramsay, 124 West Amelia Street; Corresponding Secretary, Gilbert MacNab, 492 Empire Avenue; meets first and third Sundays in month.

Name,—International Longshoremen's Association (Grain Trimmers), No. 479. Organized 1904; total membership, 40; average earnings per week, $20; average earnings per hour, 25c.; number of working hours first five days, 60; number on Saturday, 15; wages paid weekly; average number of days idle per member during year, 150; general cause of idleness, closing of navigation; total number (union and non-union) employed at calling in locality, 60; no difference in wages or hours between members and non-members; body incorporated and registered. President, W. Houston, 215 South Brodie Street; Corresponding Secretary, Budd Ellis, 113 South Vickers Street; meets first Wednesday in month.

Name,—International Longshoremen's Trimmers' (Coal Handlers) Association, No. 746. Organized August 30, 1906; total membership, 200; average earnings per week, $18; average earnings per hour, 30c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; average number of days idle per member during year, 75; general cause of idleness, slack time during winter; total number (union and non-union) employed at calling in locality, 500; body incorporated and registered. President, Nicholas Domenico, 539 McLauchlin Street; Corresponding Secretary, Arthur Jarratt, Ogden Street; meets third Tuesday in month.

Name,—International Association of Machinists, No. 309. Total membership, 75; average earnings per hour, 39c. to 45½c.; number of working hours first five days, 45; number on Saturday, 5; wages paid monthly; average number of days idle during year, from October to March 8 hours per day, 5 days per week; general cause of idleness, slackness in trade; total number (union and non-union) employed at trade in locality, 80; cash benefits, death, $50 to $200. President, James Wilkinson, 414½ North May Street; Corresponding Secretary, H. Stafford, 138 Heron Street; meets second and fourth Tuesdays in Month.

Name,—International Brotherhood of Maintenance of Way Employees, No. 128. Organized February, 1903; total membership, 120; average earnings per week, varies; average earnings per hour, varies; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no difference in wages or hours between members and non-members; death benefits, $250 to $1,000. President, W. J. Stinson, 125 Leith Street; Corresponding Secretary, A. Rowe, 320 North Harold Street; meets fourth Saturday in month.

Name,—International Moulders' Union, No. 429. Organized Sept. 28, 1906; total membership, 16; average earnings per week, $18; average earnings per hour, 30c.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly; average number of days idle per member during year, 50; general cause of idleness, closed down; total number (union and non-union) employed at trade in locality, 136; very little difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization; cash benefits, sickness, $5.20 per week; death, $150; out of work benefits, dues remitted; body incorporated and registered. President, Thomas Morris, 430 Vicker Street South; Corresponding Secretary, William Newman, 806 Northern Avenue; meets first and third Wednesdays in month.

Name,—United Association of Plumbers, Gas Fitters, etc., No. 257. Organized July 1, 1910; total membership, 25; average earnings per week, $25; average earnings per hour, 55c.; number of working hours first five days, 45; number on Saturday, 4½; wages paid fortnightly; average number of days idle per member during year, 90; general cause of idleness, depression in trade; total number (union and non-union) employed at trade in locality, 25; cash benefits, sickness, $5 per week; death, $100; body registered. President, C. Stauch, c/o Anderson & Co.; Corresponding Secretary, R. Schmidt, 112 South John Street; meets second Thursday in month.

Name,—Brotherhood of Railroad Trainmen, No. 306. Organized Sept. 23, 1883; total membership, 150; average earnings per week, $25; average earnings per hour, 28c.; number of working hours first five days, mileage basis; number on Saturday, mileage basis; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 170; no difference in wages or hours of labour between members and non-members; cash benefits, death, $500 to $1,500; body incorporated and registered. President, J. J. Nagle, Fort William; Corresponding Secretary, Fred. Hutchins, 307 Finlayson Street; meets first and third Sundays in month.

Name,—International Typographical Union, No. 417. Organized June 15, 1905; total membership, 21; average earnings per week, $21; average earnings per hour, 43⅓c.; number of working hours first five days, 40; number on Saturday, 8; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 21; cash benefits, death, $75 to $400; Superannuation, $5 per

week. President, D. Ross, Box 396; Corresponding Secretary, Geo. E. Carter, 134 North Franklin Street; meets first Saturday in month.

GALT.

Name,—Journeymen Barbers' International Union of America, No. 413. Organized August 12, 1902; total membership, 17; average earnings per week, $12; average earnings per hour, 18c. to 20c.; number of working hours first five days, 50; number on Saturday, 15; wages paid weekly; cash benefits, sickness, $5 per week; death, $25 to $500. President, Allen Wilson, South Water Street; Corresponding Secretary, John R. Soutar, Box 1155, Main Street, Galt; meets last Thursday in month.

Name,—Bricklayers' and Masons' International Union, No. 15. Organized 1902; total membership, 71; average earnings per week, $22; average earnings per hour, 45c. to 50c.; number of working hours first five days, 40; number on Saturday, 8; wages paid weekly and fortnightly; average number of days idle per member during year, 50 to 200; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 80; difference in wages or hours between members and non-members, union 50c. per 8-hour day; non-union 45c. per 10-hour day; death benefit, $300; body incorporated and registered. President, A. S. Underhill, Preston Post Office; Corresponding Secretary, W. R. Johnston, Box 208, Hespeler; meets first and third Wednesdays in month.

Name,—United Brotherhood of Carpenters and Joiners, No. 1,216. Total membership, 75; average earnings per week, $14; average earnings per hour, 30c.; number of working hours first five days, 50; number on Saturday, 5; wages paid fortnightly; average number of days idle per member during year, 40; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 120; difference in wages or hours between members and non-members, non-union receive from 5c. to 10c. per hour less than union men; death benefit, $50. President, William Rigsby; Corresponding Secretary, A. G. Robb; 40 Henry Street; meets first and third Mondays in month.

Name,—Amalgamated Society of Engineers, No. 680. Organized November, 1903; total membership, 11; number of working hours first five days, 50; number on Saturday, 5; wages paid fortnightly; cash benefits, sickness, $2.50 per week; death, $60; superannuation, $2.50 per week; out of work benefit, $2.50 per week; body incorporated and registered. President, Wm. Oxtoby, Box 685; Corresponding Secretary, H. C. Brade, Box 1,103, Galt; meets Wednesday, June 19th, and every alternate Wednesday.

Name,—International Association of Machinists, No. 120. Total membership, 40; average earnings per week, about $12; average earnings per hour, 24c.; number of working hours first five days, 50; number on Saturday, 5; wages paid fortnightly; total number (union and non-union) employed at trade in locality, 400; no difference in wages or hours between members and non-members; cash benefits, sickness, $4 per week; death, $50 to $200; out of work benefit, $6 and $8 per week; body registered. President, Herman Ableson, Middleton Street; Corresponding Secretary, John E. Fulton, Box 463, Galt; meets alternate Mondays in month.

Name,—International Moulders' Union, No. 447. Organized May 7, 1903; total membership, 100; average earnings per week, $14; average earnings per hour,

25c.; number of working hours first five days, 50; number on Saturday, 5; wages paid fortnightly; average number of days idle per member during year, 25; general cause of idleness, slackness in trade; total number (union and non-union) employed at trade in locality, 175; no difference in wages and hours of labour between members and non-members of organization; cash benefits, sickness, $5.40 per week; death, $100 to $200; out of work benefits, dues remitted. President, Jos. E. Kent, Galt; Corresponding Secretary, David Melvin, Box 356, Galt; meets first and third Thursdays in month.

Name,—International Typographical Union, No. 411. Organized April, 1901; total membership, 16; average earnings per week, $14; average earnings per hour, 29½c.; number of working hours first five days, 43; number on Saturday, 5; wages paid weekly; total number (union and non-union) employed at trade in locality, 17; difference in wages or hours of labour between members and non-members, non-union men receive about $12 a week and work 54 hours; cash benefits, International pays death and strike benefits and old age pension; no local benefits. President Frank Dorschell, North Water Street; Corresponding Secretary, Geo. J. Hogan, 37 North Water Street; meets first Tuesday in month.

Graham.

Name,—Brotherhood of Railway Carmen (Frenchman's Head), No. 28. Organized Nov. 7, 1911; total membership, 19; average earnings per week, $15.60; average earnings per hour, 26c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 26; no difference in wages or hours between members and non-members; body incorporated and registered. President, W. Bonnin, P. O., Graham; Corresponding Secretary, John North, P.O., Graham; meets third Sunday in month.

Guelph.

Name,—Journeymen Barbers' International Union, No. 310. Organized June, 1901; total membership, 18; average earnings per week, $12; average earnings per hour, 20c. to 21c.; number of working hours first five days, 50; number on Saturday, 13; wages paid weekly; average number of days idle per member during year, 30; general cause of idleness, holidays; total number (union and non-union) employed at trade in locality, 29; no difference in wages or hours between members and non-members; cash benefits, sickness, $5 per week; death, $75 to $500. President, J. Egan, 5 Thorp Street; Corresponding Secretary, Alfred McCainsh, 145 Wyndham Street; meets last Monday in month.

Name,—Bartenders' International League of America, No. 104. Organized October, 1901; total membership, 23; average earnings per week, $16; average earnings per hour 22¼c.; number of working hours first five days, 60; number on Saturday, 12; wages paid weekly; no idle days; total number (union and non-union) employed at calling in locality, 40; difference in wages or hours between members and non-members, $3 per week; death benefits, $50; body incorporated. President, Wm. Mulroney, c-o American Hotel; Corresponding Secretary, Robert McCaw, c-o Victoria Hotel; meets first Fridays in month.

Name,—United Brewery Workers, No. 300. Total membership, 15; average earnings per week, $10; average earnings per hour, 17c.; number of working hours first five days, 50 in summer; 45 in winter; number on Saturday, 5; wages

paid fortnightly; no idle days; total number (union and non-union) employed at calling in locality, 32; difference in wages and hours between members and non-members, non-union work longer hours; wages about the same; body registered. President, Antony Grusleski, 69 Edinburgh Road; Corresponding Secretary, W. Golding, 9 Preston Street; meets first Thursdays in month.

Name,—Bricklayers', Masons' and Plasterers' International Union, No. 3. Organized 1883; total membership, 60; average earnings per week, $24; average earnings per hour, 50c.; number of working hours first five days, 40; number on Saturday, 8; wages paid weekly and fortnightly; average number of days idle per member during year, 125; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 6; difference in wages or hours between members and non-members, non-union receive 35c. per hour; superannuation, mortuary fund from International Union; no special work for members. President, E. Simpson, 13 George Street; Corresponding Secretary, Wm. Cook, 52 Tiffany Street; meets second and fourth Thursday in month.

Name, Federated Association of Letter Carriers, No. 18. Organized Sept., 1908; total membership, 12; average earnings per week, $13 and $15; average earnings per hour, 22½c.; and 25c.; number of working hours first five days, 45; number on Saturday, 9; wages paid fortnightly; no idle days; total number (union and non-union) employed at calling in locality, 13; no difference in wages or hours between members and non-members; body incorporated and registered. President, Harry Winters, 50 Nottingham Street; Corresponding Secretary, A. T. Pearson, 261 Oxford Street, meets every Tuesday in month.

Name,—International Moulders' Union of North America, No. 212. Organized June 5, 1881; total membership, 108; average earnings per week, $20; average earnings per hour, 35c.; number of working hours first five days, 47½; number on Saturday, 8½; wages paid weekly and fortnightly; general cause of idleness, sickness and stock taking; total number (union and non-union) employed at trade in locality, 150; difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization, 10 per cent.: cash benefits, sickness, $5.40 per week; death, $100 to $200; out of work benefits, 40c. per week. President, W. J. Lucas, McDonnell Street; Corresponding Secretary, Freeman W. Felker, 114 Northumberland Street; meets first and third Fridays in month.

Name,—Piano and Organ Workers, No. 34. Organized 1902; total membership, 78; average earnings per week, $12.50; average earnings per hour, 22½c.; number of working hours first five days, some 50 and some 45; number on Saturday, some 5, some 4; wages paid fortnightly; average number of days idle per member during year, 20; general cause of idleness, slackness in trade; total number (union and non-union) employed at trade in locality, 180; no difference in wages or hours between members and non-members: cash benefits, sickness, $5 per week; death, $50 to $300; no special work for members. President, J. Cemidge, Dundas Road; Corresponding Secretary, Geo. Cutting, 127 Paisley Street; meets third Thursday in month.

Name,—Metal Polishers', Buffers', Platers' and Brass Workers' International Union of North America, No. 56. Organized Sept. 14, 1910; total membership, 9; average earnings per week, $18; average earnings per hour, 25c.; number of working hours first five days, 50; number on Saturday, 9; no idle days: total number (union and non-union) employed at trade in locality, 9; no difference

in wages and hours between members and non-members; no special work for members. President, W. Bolton, Wellington Street; Corresponding Secretary, A. Huchson, Woolwich; meets first Wednesday in month.

Name,—International Typographical Union, No. 391. Organized July,1900; total membership, 30; average earnings per week, $15; average earnings per hour, 31¼c.; number of working hours first five days, 42; number on Saturday, 6; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 30; cash benefits, death, $85; body incorporated. President, Thos. E. Hall, c-o "Herald" Office; Corresponding Secretary, Fred. Kinsey, Box 104, Guelph; meets second Monday in month.

Hamilton.

Name,—Journeymen Barbers' International Union of America, No. 131. Organized 1900; total membership, 110; average earnings per week, $14; number of working hours first five days, 51¼; number on Saturday, 13¼; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 180; difference in wages and hours of labour of those engaged at trade in locality, about $4 per week; cash benefits, sickness, $5 per week; death, $75 to $500. President, Herman Paro, 200 George Street; Corresponding Secretary, H. J. Halford, 59 John Street South; meets first and third Mondays in month.

Name,—Bartenders' International Union of America, No. 197. Organized Nov. 8, 1899; total membership, 124; average earnings per week, $15; number of working hours first five days, 50; number on Saturday, 10; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 130; difference in wages and hours of labour of those engaged at trade in locality, between members and non-members, $5 per week; cash benefits, sickness, $5 per week; death, $50; body incorporated. President, George Hibberd, 123 James Street South; Corresponding Secretary, John Farr, 24 Barton Street East; meets first and third Saturdays in month.

Name,—International Brotherhood of Bookbinders, No. 114. Organized 1902; total membership, 8; average earnings per week, $14.50; average earnings per hour, 30c.; number of working hours first five days, 44; number on Saturday, 4; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 15; no difference in wages or hours of labour between members and non-members of organization; cash benefits, death, $100; no special work for members. President, John Glockling, 33 Jones Street; Corresponding Secretary, W. E. Monk, 120 Lock Street West; meets last Friday in month.

Name,—Boot and Shoe Workers' International Union, No. 228. Organized Nov. 3, 1900; total membership, 95; average earnings per week, piece work; average earnings per hour, piece work; number of working hours first five days, 50; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 7; general cause of idleness, stock taking; total number (union and non-union) employed at trade in locality, male, 160; female, 80; all are members of organization; cash benefits, sickness, $8 per week; death, $130. President, Joseph Gimblett, East Avenue North; Corresponding Secretary, H. A. Harrison, 43 Melbourne Street; meets third Tuesday in month.

Name,—Boot and Shoe Workers' International Union, No. 232. Organized November, 1900; total membership, 30; average earnings per week, $14.85; average earnings per hour, 27c. number of working hours first five days, 50;

number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 20; general cause of idleness, between seasons; cash benefits, sickness, $5 per week; death, $50 to $100. President, P. J. Kennedy, 218 John Street North; Corresponding Secretary, Thos. J. Connell, 31 Steven Street, meets fourth Friday in month.

Name,—Boot and Shoe Workers' International Union No. 234 (Female). Organized April 10, 1895; total membership, female, 75; average earnings per week, $8; average earnings per hour, 15c.; number of working hours first five days, 45; number on Saturday, 4; wages paid weekly; average number of days idle per member during year, 14; general cause of idleness, stock taking; cash benefits, sickness, $5 per week; death, $100. President, Annie Folland, 205 Cannon Street East; Corresponding Secretary, Ethel Copeland, 132 Markland Street; meets fourth Thursday in month.

Name,—Boot and Shoe Workers' International Union, No. 444. Organized 1904; total membership, 26; average earnings per week, $12; average earnings per hour, 20c.; number of working hours first five days, 55; number on Saturday, 5; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 35; cash benefits, sickness, $8 per week; death, $100; body registered. President, Fred. Wills, 163 Young Street; Corresponding Secretary, W. H. Hamilton, 15 Hess Street South; meets second Friday in month.

Name, International Brewery Workers' Union, No. 312. Total membership, 80; average earnings per week, $12 to $14; average earnings per hour, 24c. to 27c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; number of days idle per member during year, 30; general cause of idleness, depression in trade; total number (union and non-union) employed at calling in locality, 60; no difference in wages or hours between members and non-members; body incorporated. President, Geo. King, 245 Young Street; Corresponding Secretary, A. E. Bates, 27 Barton Street East; meets second and fourth Tuesdays in month.

Name,—International Association of Bridge and Structural Iron Workers, No. 95. Organized, March 26, 1906; total membership, 35; average earnings per hour, 35c.; number of working hours first five days, 45; number on Saturday, 5; wages paid fortnightly; total number (union and non-union) employed at trade in locality, 90; death benefit, $100. President, H. J. Cox, 24 Norwood Avenue; Corresponding Secretary, Don Urquhart, 25 Wood Street East; meets second and fourth Thursday in month.

Name,—International Broom and Whisk Makers' Union, No. 9. Organized 1893; total membership, 16; average earnings per week, $14; average earnings per hour, 28c.; number of working hours first five days, 45; number on Saturday, 4½; wages paid weekly; average number of days idle per member during year, 10; general cause of idleness, lack of stock; total number (union and non-union) employed at trade in locality, 16; body registered. President, James Petfield, 75 East Hunter Street; Corresponding Secretary, W. H. McAdam, 90 South Catharine Street; meets second Monday in month.

Name,—Amalgamated Society of Carpenters and Joiners, No. 855. Organized 1875; total membership, 125; average earnings per week, $17; average earnings per hour, 40c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 60; general cause of idleness, weather conditions; cash benefits, sickness, $3 per week; death, $60; superannuation, $1.75 to $2 per week; out of work benefit, 2.50

per week. President, Albert Pye, 96 Wellington Street North; Corresponding Secretary, A. Burton, 46 Garfield Avenue South; meets every alternate Monday in month.

Name,—United Brotherhood of Carpenters and Joiners of America, No. 18. Organized 1882; total membership, 107; number of working hours first five days, 40; number on Saturday, 4; wages paid weekly and fortnightly; average number of days idle per member during year, 50; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 800; difference in wages or hours between members and non-members, union men work 44 hours per week, 40c. per hour; non-union men work up to 60 hours and down to 25c. per hour; cash benefits, sickness, grants from contingent fund, death, $100 to $200; wife's funeral donation, $25 to $50. President, J. V. J. Frid, 25 Nelson Street; Corresponding Secretary, Albert Blythe, 49 Wellington Street; meets first and third Tuesdays in month.

Name,—American Brotherhood of Cement Workers, No. 170. Organized Aug. 14, 1911; total membership, 10; average earnings per week, $22; average earnings per hour, 50c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; general cause of idleness, frosty weather; total number (union and non-union) employed at trade in locality, 10; difference in wages and hours between members and non-members of organization, non-union wages 30c. to 35c., 10 hours a day; cash benefits, death, $50 and upwards; out of work benefits, strike, $5 per week; body incorporated and registered. President, John A. McNab, 21 Tuckett Street; Corresponding Secretary, W. B. Irving, 92 East Avenue North; meets first and third Mondays in month.

Name,—International Cigarmakers' Union, No. 55. Organized 1869; total membership, male, 275; female, 15; average earnings per week, male, $13; female, $13; number of working hours first five days, 40; number on Saturday, 4; wages paid weekly; average number of days idle per member during year, 15; general cause of idleness, stock taking; total number (union and non-union) employed at trade in locality, male, 275; female, 15; all are members of organization; cash benefits, sickness, $5 per week; death, $50 to $500; out of work benefits, $3 per week; body registered. President, C. J. Meadow, 11 McNeil Street; Corresponding Secretary, F. Hough, 170 Duke Street, meets second Tuesday in month.

Name,—Order of Railway Conductors, No. 27. Organized, April 5, 1881; total membership, 42; average earnings per week, $25; average earnings per hour, 24c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 50; no difference in wages or hours of labour between members and non-members of organization; cash benefits, sickness, $3 per week; death, according to amount insured; special work for members, Y. M. C. A. at terminals. President, H. Mandar, 64 Strachan East; Corresponding Secretary, A. Cameron, 297 York Street; meets first and third Sundays in month.

Name,—Brotherhood of Locomotive Engineers, No. 133. Total membership, 94; average earnings per week, $25; average earnings per hour, 35c.; number of working hours first five days, 60; number on Saturday, 12; wages paid weekly and fortnightly; no difference in wages or hours of labour between members and non-members; cash benefits, insurance, $1,500; one man can carry three policies; superannuation, G. T. R. pension; body incorporated and registered. President, Jas. Oliver, 198 Lock Street North; Corresponding Secretary, A. O. Griffitt, 193 Napier Street; meets second and fourth Sundays in month.

Name,—Canadian Association of Stationary Engineers, No. 2. Organized May, 1887; total membership, 51; average earnings per week, $13.50; average earnings per hour, 22½ c.; number of working hours first five days, 50; number on Saturday, 10; wages paid weekly and fortnightly; the past year has been very good for engineers; total number (union and non-union) employed at trade in locality, probably 150, have no definite information; special work for members, papers read at every meeting; body incorporated. President, W. Lambuton, 19 Cannon Street West: Corresponding Secretary, A. W. Heath, 111 Burns Street; meets second and fourth Thursdays in month.

Name,—Brotherhood of Locomotive Enginemen and Firemen, No. 151. Organized 1873; total membership, 83; average earnings per week, $12; average earnings per hour, 20c.; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 40 in G. T. R. union; 38 non-union; rest of membership on T. H. & B.; no difference in wages or hours between members and non-members; cash benefits, sickness, 50c. per day; death, amount of insurance in union; superannuation, at age limit on G. T. R.; body incorporated and registered. President, George Thedorff, 91 Robert Street; Corresponding Secretary, Thos. McQueen, 56 Strachan Street West; meets first and third Sundays in month.

Name,—United Garment Workers of America, No. 256. Total membership 246; average earnings per week. $15; average earnings per hour, 30⅗c.; number of working hours first five days, 45; number on Saturday, 4; wages paid weekly; average number of days idle per member during year, 25; general cause of idleness, slack season; total number (union and non-union) employed at trade in locality, male, 1,000; female, 400; no difference in wages or hours between members and non-members. President, M. Lavine, 25 Binley Street; Corresponding Secretary, S. L. Landers, 39 Charles Street; meets every second Tuesday in month.

Name,—Journeymen Horseshoers' Union, No. 72. Organized March 23, 1896; total membership, 12; average earnings per week, $14; average earnings per hour, 25c.; number of working hours first five days, 50; number on Saturday, 5; wages paid weekly; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 30; difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization, $2 to $4; body incorporated and registered. President, Wiliam R. Allen, 139 Caroline Street South; Corresponding Secretary, Albert Decker, 83 Smith Avenue; meets second Wednesday in month.

Name,—Federal Labour Union (City Firemen), No. 11. Organized Jan. 17, 1900; total membership, 51; wages paid fortnightly; total number (union and non-union) employed at calling in locality, 72; cash benefits, death. $50; body incorporated and registered. President, Jas. McHendrie, 11 Stuart Street West; Corresponding Secretary, Jas. C. Hotrum, 251 Wellington Street North; meets first Monday in month.

Name,—International Union of Wood, Wire and Metal Lathers, No. 145. Organized Dec. 15, 1899; total membership, 25; average earnings per week, $17.50; average earnings per hour, 40c.; number of working hours first five days, 40; number on Saturday, 4; wages paid weekly; average number of days idle per member during year, 80; general cause of idleness, lack of building during winter; total number (union and non-member) employed at trade in locality, 50; difference in wages or hours between members and non-members, non-members work 9 hours per day and receive 35c. per hour; death benefit. $100. President, Henry

Potter, 26 Holton Avenue; Corresponding Secretary, D. Gilmore, 147 Lottridge Street; meets first and third Wednesdays in month.

Name,—International Association of Longshoremen, No. 792. Organized Nov. 19, 1911; total membership, 77; average earnings per week, $13; average earnings per hour, 30c.; wages paid by job; average number of days idle per member during year, uncertain; general cause of idleness, close of navigation; body incorporated and registered. President, Arthur Hill, 15 Murray Street West; Corresponding Secretary, E. Savage, 28 Simcoe Street West; meets second and fourth Thursdays in month.

Name,—International Moulders' Union of America, No. 26. Organized 1860; total membership, 405; average earnings per week, $15; number of working hours first five days, 50; number on Saturday, 5; wages paid weekly and fortnightly; cash benefits, sickness, $5.40 per week; death, $100 to $200. President, Thomas Church, 81 Pearl Street North; Corresponding Secretary, Jas. W. Ripley, 159 Mary Street; meets every Wednesday evening in the year.

Name,—Musicians' Protective Association, No. 93. Organized April 9, 1903; total membership, male, 200; female, 4. President, A. J. Nelligan, 81 Preston Street East; Corresponding Secretary, Jos. Gimblett, 120 East Avenue North; meets second Sunday in month.

Name,—Painters, Decorators, and Paperhangers of America, No. 205. Organized June 26, 1900; total membership, 100; average earnings per hour, 32½c.; number of working hours first five days, 45 in summer, 40 in winter; number on Saturday, 4; wages paid weekly; average number of days idle per member during year, 60; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 300; difference in wages or hours between members and non-members, 7½c. per hour more for union men and about 10 hours per week longer for non-union men; cash benefits, death, $50 to $300; body incorporated. President, E. Foley, 146 Hughson Street South; Corresponding Secretary, George Purcell, 76 Main Street West; meets first and third Mondays in month.

Name,—Operative Plasterers' International Association of the United States and Canada, No. 298. Organized, 1901; total membership, 93; average earnings per week, $13; average earnings per hour, 50c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 100; general cause of idleness, lack of work; total number (union and non-union) employed at trade in locality, 118; difference in wages or hours between members and non-members, 5c. and 10c. per hour; cash benefits, death, $250. President, B. J. Joyelen, Woodbine Crescent; Corresponding Secretary, Geo. Alderson, Chedoke P.O., Hamilton; meets first and third Thursdays in month.

Name,—Metal Polishers', Buffers', Platers' and Brass Workers' International Union, No. 26. Total membership, 44; average earnings per week, $15; average earnings per hour, 30c.; number of working hours first five days, 50; number on Saturday, 5; wages paid fortnightly; total number (union and non-union) employed at trade in locality, 75; difference in wages or hours between members and non-members, non-union receive $5 per week less; no difference in hours; cash benefits, sickness, $3.50 per week; death, $200; body incorporated and registered. President, M. C. Manvell, 99 Edinburgh Avenue; Corresponding Secretary, M. D. Irvine, 60 Edinburgh Avenue; meets first and third Wednesday in month.

Name,—International Printing Pressmen's and Assistants' Union, No. 176.

Organized Nov. 4, 1904; total membership, 60; average earnings per week, pressmen, $16; feeders, $9; average earnings per hour, pressmen, 33 1-3c.; feeders, 18¾c.; number of working hours first five days, 43.20; number on Saturday, 4.40; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 70; cash benefits, death, $100; have at headquarters, Rogersville, Tenn., a technical school, also conduct correspondence courses, and a home and sanitorium for consumptive members. President, B. R. Humphrey, 80 Emerald Street South; Corresponding Secretary, Wm. R. Berry, 193 Market Street; meets fourth Friday in month.

Name,—Amalgamated Association of Sheet Metal Workers, No. 61. Organized, 1899; total membership, 50; average earnings per week, $16.25; average earnings per hour, 32½c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 15; general cause of idleness, cold or stormy weather; total number (union and non-union) employed at trade in locality, 75; difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization, 12½c. to 18c., and about 10 hours time; cash benefits, sickness, dues remitted; death, $100; out of work benefits, just what local can give, or as members are in need; special work for members, trade instruction by members; body incorporated and registered. President, Thomas Hill, 310 Hess Street South; Corresponding Secretary, Geo. E. Farr, 20 Colborne Street; meets first and third Fridays in month.

Name,—International Alliance of Theatrical Stage Employees, No. 129. Organized July 14, 1906; total membership, 30; average earnings per week, $15; average earnings per hour, 25c.; number of working hours first five days, 30; number on Saturday, 6; wages paid weekly; average number of days idle per member during year, 90; general cause of idleness, close of theatres; total number (union and non-union) employed at calling in locality, 30; no difference between members and non-members of organization, body incorporated and registered. President, Alf. Thompkins, 37 Stuart Street East; Corresponding Secretary, G. Fitzpatrick, 52 Spring Street; meets fourth Sunday in month.

Name,—Stonecutters' Association of North America. Organized Dec. 5, 1853; total membership, 40; average earnings per week, $20; average earnings per hour. 47½c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 75; general cause of idleness winter weather; total number (union and non-union) employed at trade in locality, 40; death benefit, $100. President, Thos. Nixon, 470 John Street North; Corresponding Secretary, George Kayll, 816 King Street West; meets second and fourth Thursdays in month.

Name,—Stove Mounters' International Union, No. 35. Total membership, 12; average earnings per week, $12; average earnings per hour, 25c.; number of working hours first five days, 50; number on Saturday, 5; wages paid fortnightly; average number of days idle per member during year, 25; general cause of idleness, slackness of trade; total number (union and non-union) employed at trade locally, 18. President, William Keegan, 67 Cheaver Street; Corresponding Secretary, Thos. Bevers, 25 Tisdale Street; meets first Monday in month.

Name,—Amalgamated Association of Street and Electric Railway Employees of America, No. 107. Organized April, 1899; total membership, 140; average earnings per week, $13; average earnings per hour, 20c.; number of working hours first five days, 55; number on Saturday, 11; wages paid fortnightly; no idle days; total number (union ond non-union) employed at calling in locality, 200; no

difference in wages or hours of labour between members and non-members; cash benefits, sickness, $3 per week; death, $100 to $800. President, George Gould, 187 Lock Street North; Corresponding Secretary, C. E. Anderson, 205 Ferguson Avenue South; meets second and fourth Saturdays in month.

Name,—Journeymen Tailors' Union of America, No. 149. Organized Jan. 1, 1892; total membership, male, 42; female, 8; average earnings per week, male, $15; female, piece work; average earnings per hour, male, 25c.; female, piece work; number of working hours first five days, 50; number on Saturday, 10; wages paid weekly; average number of days idle per member during year, 28; general cause of idleness, slackness of trade; total number (union and non-union employed at trade in locality, male, 50; female, 18; no difference in wages or hours between members and non-members; cash benefits, sickness, $5 per week; death, $100. President, Chas. Smith, 300 Hunter Street West; Corresponding Secretary, H. J. Eickoff, 234 Lock Street North; meets third Monday in month.

Name,—Order of Railroad Telegraphers, No. 155. Organized Jan. 1, 1912; total membership, 27; wages paid monthly; total number (union and non-union) employed at calling in locality, 27; no idle days; no difference in wages or hours between members and non-members. President, W. H. Staniland, Grimsby; Corresponding Secretary, E. D. Armstrong, Box 98, Smithville; meets second Sunday in month.

Name,—Tobacco Workers' International Union, No. 48. Organized Sept. 7, 1899; total membership, male, 75; female, 85; average earnings per week, piece work; average earnings per hour, piece work; number of working hours first five days, 50; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 90; general cause of idleness, overstocked; total number (union and non-union) employed at trade in locality, male, 90; female, 120; no difference in wages or hours of labour of those engaged at trade in locality between members and non-members of organization; cash benefits, sickness, $3 per week; death, $50; superannuation, $8 per week. Body incorporated and registered. President, John Kelly, 3 Richmond Street; Corresponding Secretary, A. H. Broughton, 22 Hunt Street; meets second and fourth Mondays.

Name,—Brotherhood of Railroad Trainmen, No. 226. Organized, 1886; total membership, 130; average earnings per week, $21; average earnings per hour, 24c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 130; no difference in wages or hours of labour between members and non-members of organization; cash benefits, sickness, 50c. per day; death, $50; no special work for members. President, H. J. Penton, 81 Poulette Street; Corresponding Secretary, R. L. Almas, 22 Baillie Street; meets second and last Sundays.

Name,—International Typographical Union, No. 129. Organized September, 1869; total membership, 136; average earnings per week, $18; average earnings per hour 38c.; number of working hours first five days, 43; number on Saturday, 5; wages paid weekly; no idle days; no special work for members. President, George Campbell, "Spectator" News Department; Corresponding Secretary, J. J. Burns, 90 Walnut Street South; meets second Wednesday in month.

Havelock.

Name,—Order of Railway Conductors (Webbwood Division), No. 578. Organized September 16, 1910; total membership, 21; average earnings per week, $35 to $40; average earnings per hour, 36c.; number of working hours first five

days, mileage basis; number on Saturday, mileage basis; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 32; all are members of organization; death benefits, $1,000, $2,000, $3,000, $4,000; body incorporated. President, W. H. Jones, Havelock; Corresponding Secretary, J. A. Garratt, Box 47, Havelock; meets first and third Mondays in month.

Name,—Brotherhood of Locomotive Engineers, No. 658. Organized September, 1904; total membership, 34; average earnings per week, $35; average earnings per hour, 40c.; number of working hours, irregular; wages paid monthly; general cause of idleness, slackness of trade; total number (union) employed at calling in locality, 34; no difference in wages or hours of those engaged at calling in locality between members and non-members of organization; cash benefits, superannuation, minimum, $2,000; body incorporated and registered. President, Robert Jack, Havelock P.O.; Corresponding Secretary, John Toman, Box 539, Havelock; meets second and fourth Mondays in month.

Name,—Brotherhood of Railroad Trainmen, No. 293. Organized August 9, 1902; total membership, 63; average earnings per week, conductors, $26.50; trainmen, $19; average earnings per hour, conductors, 36c.; trainmen, 26c.; number of working hours, work when called upon; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 80; no difference in wages and hours of labour of those engaged at calling in locality between members and non-members of organization; cash benefits, death, $500, $1,000, $1,500; body incorporated and registered. President, J. E. Kelsey, Havelock, Ontario; Corresponding Secretary, J. S. McWhorter, Smith's Falls, Ont.; meets second and fourth Thursdays in month.

Heron Bay.

Name,—International Brotherhood of Maintenance of Way Employees, No. 231. Organized 1892; total membership, 108; average earnings per week, $11.40; average earnings per hour, 19c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 400; difference in wages and hours of labour between members and non-members, union men 19c. per hour; non-union men 17½c. per hour; body incorporated and registered. President, J. Lerwill, Heron Bay; Corresponding Secretary, A. Bianconi, Jack Fish; meets last Saturday in month.

Ingersoll.

Name,—International Brotherhood of Maintenance of Way Employees, No. 503. Organized April, 1910; total membership, 20; average earnings per week, foreman, $15; labourers, $10.20; average earnings per hour, foremen, 25c.; labourers, 17c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 50; no difference in wages or hours between members and non-members; death benefits, $500 to $1,000; body incorporated and registered. President, M. Sprague, Ingersoll; Corresponding Secretary, D. McCord, Belmont; meets on call of President.

Kenora.

Name,—Brotherhood of Railway Carmen of America, No. 236. Organized 1902; total membership, 38; average earnings per week, $14; average earnings per hour, 26½c.; number of working hours first five days, 45; number on Saturday, 5;

wages paid monthly; general cause of idleness, decrease in traffic; total number (union and non-union) employed at calling in locality, 42; no difference at present between members and non-members; cash benefits, superannuation. President, A. Kilpatrick, Post Office, Kenora; Corresponding Secretary, T. J. Connett, 24, 1st Street, Kenora; meets third Friday in month.

Name,—Brotherhood of Locomotive Engineers, No. 535. Total membership, 59; average earnings per week, $45; average earnings per hour, 45c.; total number (union and non-union) employed at calling in locality, 60; body incorporated and registered. President, J. D. Preston, Kenora; Corresponding Secretary, Jesse Penney, Kenora; meets first Wednesday and third Sunday in month.

Name,—International Association of Machinists, No. 28. Organized Feb. 11, 1907; total membership, 17; average earnings per week, $24.50; average earnings per hour, 45½c.; number of working hours first five days, 45; number on Saturday, 9; wages paid monthly; cash benefits, death, $50 to $500; out of work benefits, dues remitted. President, T. McLellan, Box 151, Kenora; Corresponding Secretary, James W. Douglas, Box 151, Kenora; meets fourth Monday in month.

Name,—Machinists' Helpers (A.F.L.), No. 12,946. Total membership, 20; average earnings per week, $14.60; average earnings per hour, 27c.; number of working hours first five days, labourers, 50; helpers, 45; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 24; no difference in wages or hours between members and non-members; out of work benefits, $4 per week. President, W. H. Tilley, P.O., Kenora; Corresponding Secretary, Thos. Turner, Box 199, Kenora; meets third Thursday in month.

Name,—Brotherhood of Railway Trainmen, No. 270. Organized September 24, 1885; total membership, 125; average earnings per week, $30; average earnings per hour, 35c.; number of working hours first five days, work whenever called upon; number on Saturday, work whenever called upon; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 125; no difference in wages or hours between members and non-members; cash benefits, death, $1,500; superannuation, 20 per cent. of wages; body incorporated and registered. President, A. McDonald, Kenora; Corresponding Secretary, John Closkey, Box 109, Kenora; meets second and fourth Wednesdays in month.

Kingston.

Name,—Journeymen Barbers' International Union of North America, No. 514. Organized April 17, 1903; total membership, 19; average earnings per week, $12; average earnings per hour, 15c.; number of working hours first five days, 50; number on Saturday, 13; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 45; no difference in wages or hours of labour of those engaged at trade in locality between members and non-members; cash benefits, sickness, $5 per week; death, $75 to $500. President, W. W. Haggaman, 161 Princes Street; Corresponding Secretary, W. J. Lemon, 377 King Street; meets last Monday in month.

Name,—Bricklayers', Masons' and Plasterers' International Union, No. 10. Organized April, 1899; total membership, 66; average earnings per week, $20; average earnings per hour, 50c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; average number of days idle per member during year, 100; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 75; difference in wages or hours between members and non-members, non-union get from 25c. to 40c. per

hour; cash benefits, death, $50 to $300; members have reading room. President, James Turney, Brock Street; Corresponding Secretary, Alex. Fowler, 323 Johnston Street; meets second and fourth Tuesdays in month.

Name,—International Builders' Labourers' Union, No. 66. Organized 1894; total membership, 98; average earnings per week, $9; average earnings per hour, 28c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; average number of days idle per member during year, 90; general cause of idleness, climatic conditions; total number (union and non-union) employed at calling in locality, 150; difference in wages or hours between members and non-members, non-union men work nine and ten hours per day and receive from $1.50 to $2 per day; death benefit, $50 to $100. President, Geo. Wilkinson, 443 Alfred Street; Corresponding Secretary, Geo. White, 214 William Street; meets first and third Wednesdays in month.

Name,—United Brotherhood of Carpenters and Joiners of North America, No. 249. Organized 1898; total membership, 70; average earnings per week, $16,80; average earnings per hour, 35c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; average number of days idle per member during year, 30; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 100; difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization, $2 per day of 9 and 10 hours; cash benefits, sicknes, $3 per week; death, $200; disability, $400; death of wife, $50. President, Wm. Buck, Victoria Street; Corresponding Secretary, W. H. Hubble, 26 Quebec Street; meets second and fourth Mondays in month.

Name,—Federated Association of Letter Carriers, No. 8. Organized Jan. 1, 1908; total membership, 12; average earnings per week, $15; average earnings per hour, 28c.; number of working hours first five days, 45; number on Saturday, 9; wages paid fortnightly; no idle days; total number (union and non-union) employed at calling in locality, 12; no difference in wages or hours between members and non-members; body incorporated. President, Robt. J. Elliott, Kingston; Corresponding Secretary, B. J. Hanlan, 88 Division Street; meets at call of chairman.

Name,—International Association of 'Longshoremen, No. 229. Organized 1900; total membership, 16; average earnings per week, $15; average earnings per hour, 25c.; number of working hours first five days, 50; number on Saturday, 10; wages paid weekly; average number of days idle per member during year, 90; general cause of idleness, slackness in winter; total number (union and non-union) employed at calling in locality, 30; cash benefits, death, $30. President, J. A. O'Neill, 269 Sydenham Street; Corresponding Secretary, Wm. Payne, 12 Ann Street; meets second and fourth Wednesdays in month.

Name,—National Association of Marine Engineers, Council No. 4. Organized 1901; total membership, 120; average earnings per week, $15 in winter, $25 in summer; average earnings per hour, 27 7-9c.; number of working hours first five days, 45 and 50 in winter, and 72 in summer; number on Saturday, 9 and 10 in winter, and 12 in summer; wages paid weekly in winter, monthly in summer; average number of days idle per member during year, 52, for those who do not work in winter; general cause of idleness, slackness of work; total number (union and non-union) employed at trade in locality, 120; all are union in locality; have lectures during winter months. President, A. E. Kennedy, 395 Johnson Street; Corresponding Secretary, James Gillie, 101 Clergy Street; meets every Monday in month.

Name, Masters' and Mates' Association. Organized 1902; total membership,

60; average number of days idle during year, about 5 months; general cause of idleness, winter; club room for use of members during winter months. President, Captain Esford, Division Street; Corresponding Secretary, Lieut.-Col. Hunter, 298 Collingwood Street; meets every afternoon during winter months.

Name,—International Moulders' Union of North America, No. 252. Organized Feb. 25, 1899; total membership, 30; average earnings per week, $16 to $18; average earnings per hour, 27½c.; number of working hours first five days, 50; number on Saturday, 5; wages paid fortnightly; no idle days; total number (union and non-union) employed at trade in locality, 30; all are members of organization; cash benefits, sickness, $5.40 per week; death, $100 to $200; out of work benefits, dues remitted: body incorporated and registered. President, R. H. Murray, 32 Patrick Street; Corresponding Secretary, Wm. E. Holland, 86 Upper William Street; meets first and third Mondays in month.

Name,—International Brotherhood of Painters, Decorators and Paperhangers of North America, No. 114. Organized March 15, 1887; total membership, 31; average earnings per week, $15; average earnings per hour, 27 7-9c.; number of working hours first five days, 45; number on Saturday, 9; wages paid weekly and fortnightly; average number of days idle per member during year, 30; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 40; no difference in hours between members and non-members, wages paid non-members not known: cash benefits, death, $100 to $300; library in union hall; body incorporated. President, William Veale, Nelson Street; Corresponding Secretary, W. T. Edgar, 16 Rideau Street; meets first and third Mondays in month.

Name,—United Association of Plumbers, Gas and Steamfitters, No. 221. Organized 1897; total membership, 26; average earnings per week, $16.50; average earnings per hour, 35c.; number of working hours first five days, 40; number on Saturday, 8; wages paid weekly; average number of days idle per member during year, 25; general cause of idleness, slackness in trade; total number (union and non-union) employed at trade in locality, 26; no difference in wages or hours between members and non-members; cash benefits, sickness, $5 per week; death, $100; body incorporated. President, M. LeBeup, King Street; Corresponding Secretary, T. Blomelly, 67 Collingwood Street; meets first and third Tuesdays in month.

Name,—International Union of Shipwrights, Joiners and Caulkers, No. 46. Organized 1902; total membership, 27; average earnings per week, $18; number of working hours first five days, 45; number on Saturday, 9; wages paid weekly; total number (union and non-union) employed at calling in locality, 100; difference in wages or hours between members and non-members, union men get anywhere from $2.50 to $3 per 9 hour day; non-union men $1.50 to $2 per 10 hour day; body incorporated. President, John R. Marks, Sr., Portsmouth; Corresponding Secretary, M. J. Porter, Front Street; meets second and fourth Tuesdays in month.

Name,—Journeymen Stonecutters' Association of North America. Organized 1888; total membership, 20; average earnings per week, $21.60; average earnings per hour, 45c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; average number of days idle per member during year, 75; general cause of idleness, lack of work; total number (union) employed at trade in locality, 20; cash benefits, death, $100. President, Charles McKinnon, 368 Barrie Street; Corresponding Secretary, W. H. Jackson, 110 Patrick Street; meets first Tuesday in month.

Name,—Journeymen Tailors' Union of North America, No. 263. Organized June 1, 1901; total membership, male, 10; female, 12; average earnings per week, male, $12; female, $3; number of working hours first five days, 45; number on Saturday, 8; wages paid weekly; average number of days idle per member during year, 50; general cause of idleness, lack of work; total number (union and non-union) employed at trade in locality, male, 30; female, 51; difference in wages and hours of labour of those engaged at trade in locality, between members and non-members of organization, non-union get less: cash benefits, sickness, $5 per week; death, $100; body incorporated and registered. President, Robert Alexander, 451 Albert Street; Corresponding Secretary, Joseph Sauve, 29 Brock Street; meets first and third Mondays in month.

Name,—International Typographical Union, No. 204. Total membership, 20; average earnings per week, $14; average earnings per hour, 30c.; number of working hours first five days, 43; number on Saturday, 5; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 25; difference in wages and hours of labour between members and non-members, non-union receive $2 or $3 per week less than union men, and work one hour per day more than union men; cash benefits, death, $400; superannuation, $5 per week after 20 years membership. President, James Bennett, "Jackson Press"; Corresponding Secretary, W. Alan Stroud, 376 Bagot Street; meets first Tuesday in month.

Leamington.

Name,—International Brotherhood of Maintenance of Way Employees, No. 302; total membership, 30; average earnings per week, $9; average earnings per hour, 15c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; body incorporated. President, A. Allen, Leamington, Ont.; Corresponding Secretary, Edwin Hodgson, Leamington, Ont. Night of meeting irregular.

Lindsay.

Name,—Order of Railway Conductors, No. 322. Organized October, 1901; total membership, 25; average earnings per week, $25; average earnings per hour, 40c.; number of working hours first five days, 60; number on Saturday, 12; wages paid monthly; average number of days idle per member during year, 30; general causes of idleness, sickness and suspension; total number (union and non-union) employed at calling in locality, 250; no difference in wages or hours between members and non-members; death benefits, full insurance $1,500; body incorporated and registered. President, G. A. Garreston, Cedar Rapids, Iowa; Corresponding Secretary, W. J. Hodgson, Box 581, Lindsay; meets first and third Sundays in month.

Name,—Brotherhood Locomotive Engineers, Hope Div. No. 174. Organized 1882; total membership, 63; average earnings per week, $30; wages paid monthly; cash benefits, insurance; body incorporated and registered. President, W. G. Chambers, Box 205, Lindsay; Corresponding Secretary, Thomas Wilkinson, Box 205, Lindsay; meets second and fourth Sundays in month.

Name,—Brotherhood of Locomotive Firemen and Enginemen, No. 136. Organized Jan. 13, 1883; total membership, 90; average earnings per week, $17; average earnings per hour, 25c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; average number of days idle per mem-

ber during year, 20; general cause of idleness, depression in business; total number (union and non-union) employed at calling in locality, 110; no difference in wages or hours between members and non-members; death benefits, $500 to $3,000; special work for members, classes in air brake machinery and transportation rules; body incorporated and registered. President, Chas. Golding, Box 212; Corresponding Secretary, W. G. Graham, Box 212; meets first and third Sundays in month.

Name,—Brotherhood of Railway Trainmen, No. 308. Organized May 10, 1889; total membership, 86; average earnings per week, $16; wages paid monthly; average number of days idle per member during year, 50; general cause of idleness, fluctuation of business; total number (union and non-union) employed at calling in locality, 135; no difference in wages or hours between members and non-members; cash benefits, sickness, according to class; death, according to class; body incorporated. President, H. Debois, Box 528, Lindsay; Corresponding Secretary, D. Walker, Box 528, Lindsay; meets second and fourth Tuesdays in month.

London.

Name,—Journeymen Barbers' International Union of America, No. 366. Total membership, 40; average earnings per week, $14; average earnings per hour, 22c.; number of working hours first five days, 50; number on Saturday, 12; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 50; difference in wages or hours between members and non-members, 5 hours weekly; $2 to $3 weekly; cash benefits, sickness, $5 per week; death, $75 to $500. President, John Frezell, 617 Dundas Street; Corresponding Secretary, J. E. Secker, 713 Richmond Street; meets fourth Monday in month.

Name,—Bartenders' International League, No. 137. Organized 1904; total membership, 60; average earnings per week, $14; number of working hours, 6 and 10 every other day, six days a week; wages paid weekly; total number (union and non union) employed at calling in locality, 56; difference in wages and hours of labour of those engaged at calling in locality between members and non-members of organization, non-union work at any wage; cash benefits, sickness, $5 per week. President, Thomas Hall, "City" Hotel; Corresponding Secretary, H. G. Edsall, 58 Colborne Street; meets second and fourth Sundays in month.

Name,—International Alliance of Bill Posters, No. 22. Organized November, 1907; total membership, 12; average earnings per week, $12; average earnings per hour, 25c.; number of working hours first five days, 40; number on Saturday, 8; wages paid weekly; no idle days; total number (union and non-union) employed at calling in locality, 12; difference in wages and hours of labour of those engaged at calling in locality between members and non-members of organization, no difference in hours, but three receive $10 per week, six receive $12 per week, and three receive $15 per week; body incorporated and registered. President, William Cooney, Queen's Avenue; Corresponding Secretary, Chas. L. Vincent, 673 Lorne Avenue; meets first Sunday in month.

Name,—International Union of United Brewery Workmen, No. 381. Organized May 1, 1910; total membership, 117; average earnings per week, $10.25; average earnings per hour, 19c.; number of working hours first five days, 47½; number on Saturday, 6; no idle days; total number (union and non-union) employed at calling in locality, 123; apprentices, 6; out of work benefits, dues remitted; body incorporated and registered. President, Thomas Johnson, 86 Chesley Avenue; Corresponding Secretary, Arthur Jackson, 134 Mill Street; meets second Thursday in month.

Name,—Bricklayers' and Masons' International Union, No. 5, Ontario. Organized Oct. 1, 1882; total membership, 60; average earnings per week, $17.50; average earnings per hour, 45c.; number of working hours first five days, 40; number on Saturday, 4; wages paid weekly; average number of days idle per member during year, 125; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 65; difference in wages and hours of labour of those engaged at trade in locality between members and non-members, non-union work 9 to 10 hours per day 6 days per week, wages 30c. to 45c.; cash benefits, death $50 to $300. President, Frank Tilbury, 668 Lorne Avenue; Corresponding Secretary, Frank C. Pierce, 687 Princess Avenue; meets second and fourth Wednesdays in month.

Name,—Amalgamated Society of Carpenters and Joiners (London Branch), No. 858. Organized June, 1860; total membership, 18; average earnings per week, $14; average earnings per hour, 28c.; number of working hours first five days, 45; number on Saturday, 4½; wages paid weekly; average number of days idle per member duirng year, 30; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 300; no difference in wages or hours of labour between members and non-members of organization; cash benefits, sickness, $3 per week; death, $60; superannuation, $2 per week; out of work benefits, $2.50 per week. President, Walter Ellis, 20 Alexander Street; Corresponding Secretary, John Tanton, 379 Waterloo Street; meets second and fourth Wednesdays in month.

Name,—United Brotherhood of Carpenters and Joiners, No. 1946. Organized Nov. 13, 1907; total membership, 36; average earnings per week, $14.25; average earnings per hour, 28½c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 100; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 400; difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization, union, 35c. per hour; non-union, 22c. per hour; cash benefits death, $100 to $200; total diability, $100 to $400; body incorporated. President, J. Cannon, 952 Colborne Street; Corresponding Secretary, J. S. Hill, 687 Dundas Street; meets second and fourth Fridays in month.

Name,—Cigarmakers' International Union of America, No. 278. Organized 1891; total membership, male, 389; female, 80; average earnings per week; male, piece work; female, piece work; number of working hours first five days, 40; number on Saturday, 4; wages paid weekly; non-union men receive lower wages; cash benefits, sickness, $5 per week; death, $50, $200, $350, $550; out of work benefits, $3 per week; body incorporated. President, W. Everett; Corresponding Secretary, W. Heslop, 93 Albion Street; meets first and third Tuesdays in month.

Name,—Order of Railway Conductors, No. 16. Organized Feb. 25, 1881; total membership, 56; average earnings per week, $30; average earnings per hour, 35c.; number of working hours first five days, about 50; number on Saturday, 10; wages paid monthly; total number (union and non-union) employed at calling in locality, about 75; no difference in wages or hours between members and non-members; cash benefits, death, $1,000 to $6,000; body incorporated. President, J. M. Riley, 575 William Street; Corresponding Secretary, H. J. Heath, Hyde Park; meets first and third Sundays in month.

Name,—International Brotherhood of Electrical Workers, No. 120. Organized March 2, 1907; total membership, 34; average earnings per week, $12; average

earnings per hour, 20c. to 25c.; number of working hours first five days, 45; number on Saturday, 9; wages paid weekly; average number of days idle per member during year, 60; general cause of idleness, lack of work; total number (union and non-union) employed at trade in locality, 100; no difference in wages or hours between members and non-members; cash benefits, death, $100; body incorporated and registered. President, Ernest Ingles, 85 Clarence Street; Corresponding Secretary, C. L. Thayer, 185 Wharncliffe Road West; meets second and fourth Thursdays in month.

Name,—Amalgamated Society of Engineers, No. 709. Organized 1851; total membership, 16; average earnings per week, $13.40; average earnings per hour, 24c.; number of working hours first five days, 50; number on Saturday, 5; wages paid weekly and monthly; total number (union and non-union) employed at trade in locality, 200; difference in wages or hours between members and non-members, about 20c. per day; cash benefits, sickness, $2.50 per week; death, $60; superannuation, $1.75 to $2.50 per week; out of work benefits, $2.50 per week; accident benefit, $500; body registered. President, Alex. McDonald, Oxford Street; Corresponding Secretary, Geo. H. Scollick, 583 Grey Street; meets alternate Fridays, dating from June 21, 1912.

Name,—Brotherhood of Locomotive Engineers, No. 68. Organized 1864; total membership, 43; average earnings per week, $25; wages paid monthly; general cause of idleness, lack of power. President, John Porteous, 374 York Street; Corresponding Secretary, John Irwin, 745 Dundas Street; meets first Sunday and third Thursday in month.

Name,—Canadian Association of Stationary Engineers, No. 30. Organized June, 1907; total membership, 85; average earnings per week, $15; average earnings per hour, 25c.; number of working hours first five days, 50; number on Saturday, 10; wages paid weekly, fortnightly and monthly; no idle days; total number (union and non-union) employed at trade in locality, 120; no difference in wages or hours of labour of those engaged at trade in locality between members and non-members of organization; special work for members, reading-room with library, educational work room always open; body incorporated. President, S. F. Cosford, 762 Waterloo Street; Corresponding Secretary, D. F. Campbell, 114 Askin Street; meets every Tuesday in month.

Name,—Brotherhood of Locomotive Firemen and Enginemen, No. 117. Total membership, 52; average earnings per week, $20; average earnings per hour, 27c.; number of working hours first five days, 50; number on Saturday, 10; average number of days idle per member during year, 50; no difference in wages or hours between members and non-members; cash benefits, sickness, $3.50 per week; death, $500 to $3,000; body incorporated and registered. President, W. J. Richardson, 14 Kitchener Avenue; Corresponding Secretary, W. McCall, 379 Hamilton Road; meets first Wednesday and third Sunday in month.

Name,—Brotherhood of Locomotive Firemen and Enginemen, No. 468. Organized Aug. 29, 1891; total membership, 68; average earnings per week, $25; average earnings per hour, 35c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; total number (union and non-union) employed at trade in locality, 100; no difference in wages or hours between members and non-members; cash benefits, sickness, voluntary grant from lodge; death, $500 to $3,000; superannuation, C. P. R. pension fund; C. P. R. Pension Fund members at 65 years of age are paid a percentage of average earnings for last ten years work, according to number of years in employment; body incorporated and

registered. President, Jno. G. Sheppard, 573 Oxford Street; Corresponding Secretary, Chas. A. Phipps, 830 Lorne Avenue; meets second and fourth Sundays in month.

Name,—United Garment Workers of America, No. 33. Organized 1898; total membership, male, 40; female, 10; average earnings per week, male, $12; female, $6; average earnings per hour, male, 25c.; female, 11c.; wages paid weekly; total number (union and non-union) employed at trade in locality, male, 125; female, 200; body registered. President, William Elliott, Emery Street; Corresponding Secretary, L. Paladino, 389 Burwell Street; meets second Monday in month.

Name,—International Association of Granite Cutters of America, Organized August, 1906; total membership, 3; average earnings per week, $18; average earnings per hour, 37½c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 48; general cause of idleness, too much Scotch granite; total number (union and non-union) employed at trade in locality, 3; no difference in wages or hours between members and non-members; cash benefits, death, $200; body incorporated and registered. Corresponding Secretary, W. Cunningham, 145 Clarence Street, London.

Name,—Federal Labour Union, No. 5. Organized 1903; total membership, 16; average earnings per week, varies according to avocation; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, mostly fully employed, some 50 days idle; general cause of idleness, depression in trade; difference in wages or hours between members and non-members, several receive a relatively higher rate than non-union, others as low as 15c. per hour; special work for members, a social evening with debates every month. President, Wm. Cole, 100 Cartwright Street; Corresponding Secretary, J. T. Marks, 425 Grey Street; meets fourth Friday in month.

Name.—Federated Association of Letter Carriers, No. 4. Organized 1886; total membership, 34; average earnings per week, $16.50; maximum, $2.75 per day; minimum, $1.75 per day; number of working hours first five days, 46¼; number on Saturday, 9½; wages paid fortnightly; no idle days; total number (union and non-union) employed at calling in locality, 34; no difference in wages or hours between members and non-members of organization; cash benefits, death, $1,000 to Federated beneficiary members; some have superannuation fund. President, T. F. Currie, Dundas Street East; Corresponding Secretary, W. M. Empey, 573 Oxford Street; meets first Wednesday in month.

Name,—International Brotherhood of Maintenance of Ways Employees, District No. 2 (C. P. R.). Organized 1889; total membership, 250; average earnings per week, $12; average earnings per hour, 20c.; number of working hours first five days, 50; number on Saturday, 10; average number of days idle per member during year, three months for one third; general cause of idleness, weather conditions; no difference in wages or hours between members and non-members; cash benefits, superannuation, $20 per month; body incorporated. President, D. Campbell, 10 Thornton Avenue; Corresponding Secretary, D. H. Walsh, 381 Central Avenue; meets last Saturday in month.

Name,—American Federation of Musicians, No. 279. Organized Feb. 2, 1892; total membership, 10. President, Harry Woostie, 210 Wharncliffe Road; Corresponding Secretary, C. N. Perrin, 352 Adelaide Street; meets fourth Sunday in month.

Name,—International Union of Metal Polishers, Buffers, Platers and Brass

Workers, No. 32. Total membership, 48; average earnings per week, $19.25; average earnings per hour, 32½c. to 35c.; number of working hours first five days, 50; number on Saturday, 5 to 8; wages paid weekly and fortnightly; average number of days idle per member during year, 15; general cause of idleness, break down of machinery and stock-taking; total number (union and non-union) employed at trade in locality, 60; difference in wages or hours between members and non-members, $1 or more per day in wages: no difference in hours of labour: death benefit, $100 to $200. President, D. H. Wright, 378 Burwell Street: Corresponding Secretary, J. Cummings, Chelsea Green Post Office: meets second and fourth Fridays in month.

Name,—United Association of Plumbers, Gas and Steamfitters, No. 289. Organized Jan. 1, 1907; total membership, 20; average earnings per week, $15.40; average earnings per hour, 35c.; number of working hours first five days, 40; number on Saturday, 4; wages paid weekly; average number of days idle per member during year, 10 to 20; general cause of idleness, no work; total number (union and non-union) employed at trade in locality, about 30; difference in wages or hours between members and non-members, union, 35c. per hour: non-union, 20c. to 35c. per hour; cash benefits, sickness, $5 per week; death, $100; out of work benefits, dues remitted. President, J. Mitchell; Corresponding Secretary, Geo. F. Avey, 728 York Street; meets second and fourth Mondays in month.

Name,—Printing Pressmen and Assistants' International Union, No. 173. Organized October, 1907; total membership, 30; average earnings per week, $12; average earnings per hour, 25c.; number of working hours first five days, 43; number on Saturday, 5; wages paid weekly; total number (union and non-union) employed at trade in locality, 60; difference in wages or hours between members and non-members, non-union receive $2 per week less, and work 2 to 3 hours more than union men; cash benefits, death, $100. President, Chas. Hollins, 270 Horton Street; Corresponding Secretary, Chas. McArdell, 111 Wellington Road: meets first Saturday in month.

Name,—International Alliance of Theatrical Stage Employees, No. 105. Total membership, 26; average earnings per week, $13.50; average earnings per hour 25c.; wages paid weekly; average number of days idle per member during year, 90; general cause of idleness, theatres closed; no difference in wages or hours between members and non-members. President, W. J. Burrows, 225 Grey Street; Corresponding Secretary, W. J. Stone, Grosvenor Street; meets first and third Sundays in month.

Name,—Journeymen Stonecutters Association. Organized 1853; total membership, 10; average earnings per week, $19.80; average earnings per hour, 45c.; number of working hours first five days, 40; number on Saturday, 4; wages paid weekly; average number of days idle per member during year, 90; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 10; no difference in wages or hours between members and non-members; cash benefits, death, $100; body incorporated. President, Robert Liston, 726 Adelaide Street; Corresponding Secretary, H. Boyd, 875 Adelaide Street; meets second and fourth Wednesdays in month.

Name,—Order of Railway Telegraphers, G. T. R. System, Div. No. 1. Organized 1893; average earnings per week, $14; number of working hours first five days, 60; number on Saturday, 12; wages paid monthly; no idle days; total number (union and non-union) on entire system, male, 1,190; female, 10; no difference in wages or hours of labour of those engaged at calling in locality between members

and non-members of organization; cash benefits, death, insurance, which is optional; no special work for members. President, F. A. Parent, Casselman, Ont.; Corresponding Secretary, D. L. Shaw, 867 Waterloo Street, London, Ont.; meets when called.

Name,—Order of Railway Telegraphers, No. 7. Total membership, 100; average earnings per week, $17; average earnings per hour, 20c.; number of working hours first five days, 60; number on Saturday, 12; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, male, 100 female, 2; no difference in wages or hours between members and non-members; cash benefits, death, $300, $500 and $1,000. President, A. E. Chapman, 265 Piccadilly Street, London; Corresponding Secretary, G. Elliott, 368 Dundas Street, London; meets third Saturday in month.

Name,—Brotherhood of Railway Trainmen, Forest City Lodge, No. 240. Organized 1883; total membership, 76; average earnings per week, $17; average earnings per hour, 22 2-3c.; number of working hours first five days, 75; number on Saturday, 15; wages paid monthly; average number of days idle during year, 42; general cause of idleness, trains not running; total number (union and non-union) employed at calling in locality, 100; no difference in wages or hours between members and non-members; cash benefits, death, $500, $750, $1,500; body incorporated. President, R. N. McLeod, 187 Langarth Street; Corresponding Secretary, W. Harris, 27 Victor Street; meets first and third Sundays in month.

Name,—Brotherhood of Railway Trainmen, London Lodge, No. 415. Organized July 13, 1891; total membership, 202; average earnings per week, $22 to $35; average earnings per hour, 24c. to 40c.; number of working hours first five days, varies; number on Saturday, varies; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 210; no difference in wages and hours between members and non-members; cash benefits, death, $500 to $1,500; body registered. President, Peter Kelleher, 850 Princess Avenue; Corresponding Secretary, W. H. Nichol, 896 Princess Avenue; meets second and fourth Sundays in month.

Name,—International Typographical Union, No. 133. Organized November, 1869; total membership, 83; average earnings per week, $15; average earnings per hour, 33 1-3c.; number of working hours first five days, news, 40; job, 43½; number on Saturday, news, 8; job, 4½; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, male, 130; female, 12; difference in wages or hours between members and non-members, union, $14 to $22 per week; non-union, $8 and upwards; union hours, 48; non-union, 54; cash benefits, sickness, $5 per week; death, $75 to $400; superannuation, $5 per week; special work for members, technical school in connection with International. President, E. J. Stein, 340 Hamilton Road; Corresponding Secretary, W. O. Ruse, 120 Wilson Avenue; meets first Thursday in month.

Merritton.

Name,—United Brotherhood of Carpenters and Joiners, No. 1,402. Organized Feb. 16, 1911; total membership, 27; average earnings per week, $20; average earnings per hour, 40c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; total number (union and non-union) employed at trade in locality, 50; difference in wages or hours between members and non-members, between 40c., 30c. and 25c. per hour; death benefits, $200; body incorporated. President, J. J. Fawell, Merritton; Corresponding Secretary, Franklin Storm, Merritt Street, Merritton; meets first and third Wednesdays in month.

Midland.

Name,—International Longshoremen's Association, No. 19. Organized Aug. 1, 1900; total membership, secret; number of working hours first five days, irregular; number on Saturday, irregular; wages paid whenever job is finished; average number of days idle per member during year, irregular; general cause of idleness, irregularity of work; total number (union and non-union) employed at calling in locality, 120; difference in wages and hours of labour of those engaged at calling in locality between members and non-members of organization, 5c. to 10c. per hour. President, George McMullen, Midland, Ont.; Corresponding Secretary, D. A. Hall, Midland, Ont.; meets first and third Tuesdays in month.

Milverton.

Name,—International Brotherhood of Maintenance of Way Employees, No. 163. Organized 1906; total membership, 45; average earnings per week, men, $10.20; foremen, $14.40; average earnings per hour, men, 17c.; foremen, 24c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 90; no difference in wages or hours between members and non-members; cash benefits, superannuation, $20 per month from C. P. R. at age of 65; body incorporated and registered. President, T. A. Netterfield, West Monkton; Corresponding Secretary, J. J. Elliott, Milverton; meets first Friday in January, April, July and October.

Niagara Falls.

Name,—Amalgamated Society of Carpenters and Joiners, No. 793. Organized May, 1905; total membership, 26; average earnings per week, $19.20; average earnings per hour, 40c.; number of working hours first five days, 40; number on Saturday, 8; wages paid weekly; average number of days idle per member during year, 36; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 300; difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization, from 5c. to 20c. per hour; cash benefits, sickness, $3 per week; death, $60 for wife, $25 for doctor; superannuation, $1.75 per week; out of work benefits, $2.50 per week; body incorporated and registered. President, C. Reid, 125 Ryerson Avenue; Corresponding Secretary, William Broomhall, 45 McGrail Avenue; meets every alternate Friday in month.

Name,—United Brotherhood of Carpenters and Joiners, No. 713. Organized Jan. 17, 1901; total membership, 128; average earnings per week, $19.20; average earnings per hour, 40c.; number of working hours first five days, 40; number on Saturday, 8; wages paid weekly; average number of days idle per member during year, 50; general cause of idleness, lack of work; total number (union and non-union) employed at trade in locality, 140; difference in wages and hours of labour of those engaged in trade in locality between members and non-members of organization, about 10c. per hour; cash benefits, death, $200; total disability, $400. President, R. O. Blayney, 245 River Road; Corresponding Secretary, Walter Harwood, 145 Ryerson Avenue; meets every Wednesday in month.

Name,—International Union of Steam Engineers, No. 232. Organized July 30, 1903; total membership, 35; average earnings per week, $21; average earnings

per hour, 35c.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly; average number of days idle per member during year, 75; general cause of idleness, no employment; total number (union and non-union) employed at trade in locality, 70; difference in wages or hours between members and non-members, about 33 1-3 per cent.; body incorporated. President, J. A. McPherson, Alexandra House, Niagara Falls Centre; Corresponding Secretary, Charles Hansel, 8 Queen Street, Niagara Falls, Ont.; meets second and fourth Fridays in month.

Name,—United Hatters of North America, No. 20. Organized 1885; total membership, 26; average earnings per week, $18.50; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 75; cause of idleness, slackness in trade; total number (union and non-union) employed at trade in locality, 41; all are members of organization; death benefits, sliding scale; body incorporated and registered. President, F. M. Zligler, Bridge Street; Corresponding Secretary, J. B. Tyler, 22 Bridge Street; meets first Monday in January, April, July and October.

Name,—Federated Association of Letter Carriers, No. 36. Organized August 25, 1911; total membership, 8; average earnings per week, $12; average earnings per hour, 25c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly. President, Lorne Robinson, 72 Ross Street; Corresponding Secretary, H. H. Smith, 164 Ontario Avenue; meets first Tuesday in month.

Name,—Journeymen Stonecutters' Association of North America. Organized 1853; total membership, 30; average earnings per week, $24; average earnings per hour, 50c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; average number of days idle per member during year, 90; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 30; no difference in wages and hours of labour between members and non-members of organization; cash benefits, death, $100; no special work for members. President, John Madden, Stamford, Ont.; Corresponding Secretary, E. Garnell, 62 Morrison Street; meets fourth Monday in month.

Name,—Brotherhood of Railway Trainmen, No. 379. Total membership, 78; average earnings per week, $25; wages paid monthly; no difference in wages or hours between members and non-members of organization; death benefits, insurance; body incorporated and registered. President, James Collins, Bridge Street; Corresponding Secretary, F. C. Ortt, Ellis Street; meets second and fourth Fridays in month.

North Bay.

Name,—International Brotherhood Blacksmiths and Helpers, No. 474. Organized May 1, 1911; total membership, 13; average earnings per week, $15.50; average earnings per hour, 31c. and 32c.; number of working hours first five days, 45; number on Saturday, 5; wages paid monthly; no idle days; total number (union and non-union) employed at trade in locality, union, 13; non-union, 1; difference in wages or hours between members and non-members, 6 hours per week. President, Robert Forsyth; Corresponding Secretary, Napoleon Turgeon, Box 798, North Bay; meets last Saturday in month.

Name,—Brotherhood of Railway Carmen of America, No. 192. Organized 1902; total membership, 82; average earnings per week, $11.50; average earnings per hour, 23c.; number of working hours first five days, 45; number on Saturday,

5; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 65; no difference in wages or hours of labour between members and non-members of organization; body incorporated and registered. President, W. Soule, Post Office, North Bay; Corresponding Secretary, H. Freeman, Box 490, North Bay; meets fourth Friday in month.

Name,—Order of Railway Conductors, Nipissing Div., No. 242. Organized 1889; total membership, 70; average earnings per week, $25; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 100; all are members of organization; cash benefits, death, $1,000, $2,000, $3,000; body registered. President, J. P. Murray, Worthington Street; Corresponding Secretary, Alex. Brown, Box 161; meets second and fourth Mondays in month.

Name,—Brotherhood of Locomotive Engineers, Nipissing Div., No. 308. Organized 1886; total membership, 85; average earnings per week, mileage basis; average earnings per hour, mileage basis; wages paid monthly; general cause of idleness, due to depression of trade throughout the country at large; total number (union and non-union) employed at calling in locality, 75; no difference in wages or hours between members and non-members of organization; special work for members, reading-room; body incorporated. President, William Hallandal, North Bay, Ont.; Corresponding Secretary, Thomas W. Turner, 183 McIntyre Street West; meets first and third Mondays in month.

North Bay.

Name,—International Brotherhood of Maintenance of Ways Employees, No. 244. Organized September, 1900; total membership, 180; average earnings per week, $10.50; average earnings per hour, 17½c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; total number (union and non-union) employed at calling in locality, 250; differences in wages and hours of labour of those engaged at calling in locality between members and non-members of organization, 15c. per day; cash benefits, insurance, not compulsory; body incorporated and registered. President, A. E. Partuchek, Warren, Ont.; Corresponding Secretary, D. C. Wilson, Mattawa, Ont.; meets last Saturday in month.

Name,—Brotherhood of Railway Trainmen, No. 249. Total membership, 175; wages paid monthly; no idle days; no difference in wages or hours between members and non-members; body incorporated and registered. President, R. H. Dingwall; Corresponding Secretary, C. Couchy, North Bay.

Orangeville.

Name,—International Brotherhood of Maintenance of Ways Employees, No. 214. Organized 1901; total membership, 250; average earnings per week, $13; average earnings per hour, 21c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; on idle days; total number (union and non-union) employed at calling in locality, 400; difference in wages and hours of labour of those engaged at calling in locality between members and non-members of organization, average earnings of non-union men 16c. per hour; cash benefits, superannuation, $20 per month; body incorporated and registered. President, R. B. McIntosh, 374 14th Street East, Owen Sound; Corresponding Secretary, D. McDougall, Box 388, Fergus; meets last Saturday in March, June, September and December.

Oshawa.

Name,—International Moulders' Union, No. 136. Organized July, 1860; total membership, 12; average earnings per week, $15; average earnings per hour, 25c.; number of working hours first five days, 50; number on Saturday, 9; wages paid fortnightly and monthly; no idle days; total number (union and non-union) employed at trade in locality, male, 200; female, 25; no difference in wages and hours between members and non-members; cash benefits, sickness, $5.40 per week; death, $100 to $275; out of work benefits, dues remitted. President, Archie Robinson, Oshawa, Ont.; Corresponding Secretary, R. H. Rogan, Box 144, Oshawa, Ont.; meets third Thursday in month.

Name,—Patternmakers' League of North America. Organized March 18, 1908; total membership, 9; average earnings per week, $14.75; average earnings per hour, 25c.; number of working hours first five days, 50; number on Saturday, 9; wages paid fortnightly; total number (union and non-union) employed at trade in locality, 30; cash benefits, sickness, $4 per week; death, $50 to $400. President, Norman Stewart, Centre Street; Corresponding Secretary, John Butchart, 217 Albert Street; meets first and third Thursdays in month.

Ottawa.

Name,—International Union of the United Brewery Workmen, No. 365. Organized Aug. 12, 1910; total membership, 60; average earnings per week, $12; average earnings per hour, 22c.; number of working hours first five days, 20; number on Saturday, 6; wages paid weekly; average number of days idle per member during year, 40; general cause of idleness, depression in trade; total number (union and non-union) employed at calling in locality, 200; no difference in wages or hours between members and non-members; President, A. Schroeder, 134 McKay Street; Corresponding Secretary, H. J. Levesque, 64 Laurier Avenue; meets second and fourth Mondays in month.

Name,—Bricklayers' International Union, No. 7. Organized 1889; total membership, 119; average earnings per week, $22.88; average earnings per hour, 52c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 145; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 149; difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization, non-union men work 9 hours at about 40c. per hour; cash benefits, death, $50 to $300. President, Samuel Moore, 5 Henry Street; Corresponding Secretary, Alexander Findlay, Jr., 313 Sunnyside Avenue; meets every second Monday in month.

Name,—Builders' Labourers' Union, No. 4. Organized 1887; total membership, 125; average earnings per week, $12.50; average earnings per hour, 28c.; number of working hours first five days, 45; number on Saturday, 5; wages paid fortnightly; average number of days idle per member during year, 75; general cause of idleness, winter weather; total number (union and non-union) employed at calling in locality, 500; difference in wages or hours between members and non-members, union, 28c. per hour; non-union, 25c. per hour; death benefits, $50; body incorporated and registered. President, Thomas Squerrell, 234 Bay Street; Corresponding Secretary, G. Williams, Britannia Bay Post Office; meets second and fourth Mondays in month.

Name,—United Brotherhood of Carpenters and Joiners of America, No. 93. Organized 1905; total membership, 325; average earnings per week, $17.50; average earnings per hour, 35c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly and fortnightly; average number of days idle per member during year, 25; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 650; difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization, some receive the same, others 4c. to 5c. less; cash benefits, death, member, $200; wife, $50; sickness, $2 per week; total disability, $400; body registered. Louis Bloum, 145 Breeze Hill Avenue; Corresponding Secretary, Emery Belair, 267 Clarence Street; meets second and fourth Tuesdays in month.

Name,—Order of Railway Conductors, Randolph Division, No. 29. Organized 1881; total membership, 75; average earnings per week, $30; average earnings per hour, mileage basis; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; general cause of idleness, slackness of traffic; no difference in wages or hours of labour between members and non-members of organization; cash benefits, death, $1,000, $2,000, $3,000. President, T. B. Lamplough, 85 Kent Street; Corresponding Secretary, J. B. Morris, 305 Bronson Avenue; meets second and fourth Sundays in month.

Name,—Brotherhood of Locomotive Engineers, No. 168. Organized September, 1882; total membership, 98; average earnings per week, $35; average earnings per hour, 39c.; number of working hours first five days, mileage basis; number on Saturday, 10 hours or 100 miles; wages paid monthly; average number of days idle per member during year, 30; general cause of idleness, holidays; all are members of organization; no difference in wages or hours between members and non-members; cash benefits, death, Brotherhood insurance. President, John Wilson, 70 Elm Street; Corresponding Secretary, J. Chisholm, 652 Wellington Street; meets second and fourth Sundays in month.

Name,—Brotherhood of Locomotive Enginemen and Firemen, No. 172. Organized 1873; total membership, 77; wages paid monthly; general cause of idleness, slack business on road; no difference in wages or hours between members and non-members; cash benefits, sickness, as decided by lodge; death, fair value policy; body incorporated and registered. President, Holland E. White, 15 Spadina Avenue; Corresponding Secretary, Thomas A. Smyth, 59 Spadina Avenue; meets second and fourth Fridays in month.

Name,—Federal Union (Gas Stokers), No. 9. Organized January 4, 1910; total membership, 14; average earnings per week, $16; average earnings per hour, 28c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; no idle days; total number (union and non-union) employed at calling in locality, 14; no difference in wages or hours between members and non-members; cash benefits, sickness, $5 per week; body registered. President, John McKibbon, 500 McLeod Street; Corresponding Secretary, Robert Lamb, 300 McKay Street; meets Thursdays and Tuesdays.

Name,—International Union of Wood, Wire and Metal Lathers, No. 60. Organized June 1, 1911; total membership, 7; average earnings per week, $22.50; average earnings per hour, 45c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 6 months; general cause of idleness, no work in our trade; total number (union and non-union) employed at trade in locality, 40; death benefit,

$50; body incorporated and registered. President, Maxime Dagenais, 113 Nicholas Street; Corresponding Secretary, Francis Fortin, Gatineau Point, Que.; meets Wednesdays in month.

Name,—International Association of Machinists, No. 412. Total membership, 80; average earnings per week, $14; average earnings per hour, 27c.; number of working hours first five days, 50; number on Saturday, 5; wages paid fortnightly and monthly; death benefits, $50 to $250; body incorporated. President, Ernest Newman, 65 Anderson Street; Corresponding Secretary, Joseph W. Vincent, 59 Concord Street; meets second and fourth Fridays in month.

Name,—International Moulders' Union, No. 280. Organized Oct. 8, 1891; total membership, 45; average earnings per week, $17.50; average earnings per hour, 28½c.; number of working hours first five days, 50; number on Saturday, winter, 9; summer, 5; wages paid fortnightly; general cause of idleness, depression in trade; total number (union and non-union) employed at trade in locality, 80; difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization, in some instances, 25c. and 50c. a day less for non-union men; cash benefits, sickness, $5.40 per week; death, $100 to $300; out of work benefits, dues remitted. President, James Fagan, 527 McLeod Street; Corresponding Secretary, J. E. Bedard, 155 Alma Street, Hull, Que.; meets first and third Thursdays in month.

Name.—Painters', Decorators' and Paperhangers' International Union, No. 200. Organized Oct. 9, 1890; total membership, 90; average earnings per week, $15 to $17.50; average earnings per hour, 30c. to 35c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly and fortnightly; average number of days idle per member during year, 30; general cause of idleness, cold weather; total number (union and non-union) employed at trade in locality, 150; difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization, 3c. to 8c. per hour; cash benefits, death, $25 to $300; body incorporated. President, Harry Herbert, 47 Turner Street; Corresponding Secretary, E. C. Brandt, 57 Bayswater Avenue; meets first and third Wednesdays in month.

Name.—International Brotherhood of Papermakers, No. 34. Organized June 19, 1910; total membership, 52; average earnings per week, $15; average earnings per hour, 31c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; no idle days; total number (union and non-union) employed at trade in locality, 140; no difference in wages or hours between members and non-members; cash benefits, death $250; body incorporated and registered. President, Morton Hutchinson, 3 Bell Street; Corresponding Secretary, L. W. Casselman, 100 Preston Street; meets first and third Sundays in month.

Name,—Operative Plasterers' International Association, No. 124. Organized Nov. 18, 1908; total membership, 70; average earnings per week, $22.50; average earnings per hour, 45c.; number of working hours first five days, 45; number on Saturdays, 5; wages paid fortnightly; average number of days idle per member during year, 30 to 60; general cause of idleness, non-employment; total number (union and non-union) employed at trade in locality, 90; difference in wages and hours of labour of those engaged at trade in locality between members and non-members of organization, non-union are paid from 25c. to 40c. per hour; cash benefits, sickness, grant from local funds; death, $50 to $200; strike or lock-out, $5 per week; body registered. President, Thomas H. Jarvis, 18 Fourth Avenue; Corresponding Secretary, John Herdman, 183 Creighton Street; meets first and third Tuesdays in month.

Name,—Plasterers' Labourers' Union, No. 1. Organized Nov. 1, 1910; total membership, 42; average earnings per week, $15; average earnings per hour, 30c.; number of working hours first five days, 45; number on Saturday, 5; wages paid fortnightly; average number of days idle per member during year, 60; general cause of idleness, lack of work; total number (union and non-union) employed at calling in locality, 150; difference in wages and hours of labour of those engaged at calling in locality between members and non-members, non-union, 20c. to 30c. per hour; cash benefits, death, $50. President, A. Bethell, Post Office, Westbro, Ottawa; Corresponding Secretary, C. Alexander, Bridge P.O., Ottawa; meets second and fourth Thursdays in month.

Name,—International Pressfeeders' and Assistants' Union, No. 9. Organized May 15, 1909; total membership, 65; average earnings per week, $7, $9, $11, $12.25; average earnings per hour, 14½c., 18¾c., 23c., 25½c.; number of working hours first five days, 43; number on Saturday, 5; wages paid weekly and fortnightly; no idle days; total number (union and non-union) employed at trade in locality, 84; difference in wages and hours of labour between members and non-members, half of wages; cash benefits, sickness, dues remitted; death, $100; out of work benefits, dues remitted. President, J. J. Rooney, 711 King Edward Avenue; Corresponding Secretary, O. Bureau, 289 St. Andrew Street; meets second Monday in month.

Name,—International Printing Pressmen's Union, No. 5. Organized 1879; total membership, 55; average earnings per week, $19; average earnings per hour, 39½c.; number of working hours first five days, 42½; number on Saturday, 5; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 55; death benefit. President, W. E. Bell, 9 Salisbury Place; Corresponding Secretary, A. J. Larden, 327 Bell Street; meets third Friday in month.

Name,—Sheet Metal Workers' International Alliance, No. 47. Organized November, 1907; total membership, 65; average earnings per week, $17.50; average earnings per hour, 35c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 75; cash benefits, death $100. President, I. Seneve, 102 Queen Street; Corresponding Secretary, William White, 119 Spruce Street; meets first and third Thursdays in month.

Name,—International Alliance of Theatrical Stage Employees, No. 95. Organized 1902; total membership, 51; average earnings per week, $18 and $20; average earnings per hour, 30c.; number of working hours first five days, 45; number on Saturday, 9; wages paid weekly; average number of days idle per member during year, 30; general cause of idleness, close of theatres; total number (union and non-union) employed at calling in locality, 81; no special work for members. President, Harry H. Haig, 358 Albert Street; Corresponding Secretary, Donald Casey, 52 Gloucester Street; meets first Sunday in month.

Name,—International Union of Steam Engineers, No. 473. Organized September, 1911; total membership, 67; wages paid fortnightly; educational classes for members twice a month. President, Charles Levois, 21 Garland Street; Corresponding Secretary, J. Lake, 267 Preston Street; meets second and fourth Wednesday in month.

Name,—International Union of Steel and Copper Plate Printers, No. 6. Organized Nov. 15, 1900; total membership, 43; number of working hours first five days, 42½; number on Saturday, 4½; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 45; no difference in

wages or hours between members and non-members; death benefit, $50. President, W. H. Kent, 969 Wellington Street; Corresponding Secretary, E. J. Lane, 127 Osgoode Street; meets first Wednesday in month.

Name,—Stereotypers' and Electrotypers' International Union of North America, No. 50. Organized Oct. 2, 1900; total membership, 11; average earnings per week, $18.50; average earnings per hour, 42c.; number of working hours first five days, 40; number on Saturday, 5; wages paid fortnightly; average number of days idle per member during year, 12; general cause of idleness, sickness and holidays; total number (union and non-union) employed at trade in locality, 11; all are members of organization; cash benefits, death, $100; no special work for members. President, Thos Miller, 27 Clegg Street; Corresponding Secretary, Chas. Coulter, 103 Main Street; meets Saturday nights in month.

Name,—Journeymen Stonecutters' International Association. Total membership, 51; average earnings per week, $19.35; average earnings per hour, 44c.; Sept. 1st, 47c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 125; general cause of idleness, severe winter and depression in building trade; total number (union and non-union) employed at trade in locality, 52; no difference in wages or hours between members and non-members; cash benefits, death, $100; body registered. President, W. E. Turner, Riverside Park; Corresponding Secretary, Geo. Birnie, 195 Gladstone Avenue; meets second and fourth Fridays in month.

Name,—Bricklayers', Masons' and Plasterers' International Union, No. 14 (Stone Masons). Organized 1889; total membership, 110; average earnings per week, $22.88; average earnings per hour, 52c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 120; general cause of idleness, bad weather, depression of trade and want of material; total number (union and non-union) employed at trade in locality, 125; difference in wages and hours between members and non-members, 2c. to 15c. per hour and 1 hour per day; and 5 hours Saturday; cash benefits, death, $100 to $300; no special work for members. President, John Cameron, 265 Parkdale Avenue; Corresponding Secretary, M. Fleury, 214 Patterson Avenue; meets alternate Mondays in month.

Name,—Brotherhood of Railway Trainmen (Jubilee Lodge), No. 129. Organized September, 1885; total membership, 205; average earnings per week, $21.50; average earnings per hour, 35c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; average number of days idle per member during year, 26; general cause of idleness, changing crews; total number (union and non-union) employed at calling in locality, 210; no difference in wages or hours between members and non-members; cash benefits, sickness, $5 per week; death, $500, $1,000, $1,500; no special work for members. President, A. E. Salmon, 3 Elm Street; Corresponding Secretary, T. E. Burgess, 103 Spadina Avenue; meets first and third Sundays in month.

Name,—Brotherhood of Railway Trainmen, No. 185. Total membership, 135; average earnings per week, paid on mileage basis; average earnings per hour, conductors, $3.63; brakemen, $2.42 per 100 miles; 10 hours or 100 miles constitute one day; wages paid monthly; average number of days idle per member during year, uncertain; general cause of idleness, depression in freight traffic; total number (union and non-union) employed at calling in locality, 150; no difference in wages or hours of labour between members and non-members of organization; cash benefits, death or total disability, $500, $1,000, $1,500; body

incorporated and registered. President, John Maloney, 62 Henderson Avenue; Corresponding Secretary, H. H. Brown, 540 Lyon Street; meets alternate Sundays in month.

Name,—International Typographical Union, No. 102. Organized 1866; total membership, male, 275; female, 7; average earnings per week, male, $18; female, $18; average earnings per hour, male, 37c.; female, 37c.; number of working hours first five days, 42½; number on Saturday, 5; wages paid weekly and fortnightly; no idle days; total number (union and non-union) employed at trade in locality, male, 400; female, 7; difference in wages or hours between members and non-members, no great difference in wages, but non-union men work as much as 14 hours per day when work requires, without extra remuneration; cash benefits, sickness, $4 per week; death, $75 to $400; superannuation, $5 per week at 60 years; special work for members, I.T.U. course, conducted under the direction of I.T.U. commission; body registered. President, P. M. Draper, 112 Florence Street; Corresponding Secretary, A. E. Sheppard, 51 Victoria Street (Box 491), Ottawa; meets first Saturday in month.

Name,—Canadian Typographical Union, No. 1. Organized Oct. 29, 1906; total membership, 150; average earnings per week, $19; average earnings per hour, 39c.; number of working hours first five days, 42½; number on Saturday, 5; wages paid weekly and fortnightly; no idle days; cash benefits, sickness, $4 per week; death, $200. President, Chas. G. Pepper, 239 Frank Street; Corresponding Secretary, F. J. Guthaus, 196 Stanley Avenue; meets second Saturday in month.

Owen Sound.

Name,—Canadian Association of Stationary Engineers, No. 25. Organized 1906; total membership, 30; average earnings per week, $15 to $17.50; average earnings per hour, 25c. to 27½c.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly and monthly; average number of days idle per member during year, 84; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 40; difference in wages or hours between members and non-members, 2½c. to 5c.; special work for members, have room for educational purposes; body incorporated. President, E. Hooey, 1524 Fifth Avenue West; Corresponding Secretary, W. J. Needham, 2089 Third Avenue East; meets every Thursday in month.

Name,—Moulders' Union of North America, No. 413. Organized April 7, 1910; total membership, 25; average earnings per week, stove shop, $18 to $22; machinery, $14 to $16; average earnings per hour, stove shop, piece work; machinery, 24c. to 27½c.; number of working hours first five days, 50; number on Saturday, 5 in summer; wages paid fortnightly; average number of days idle per member during year, 50; general cause of idleness, slackness in trade; total number (union and non-union) employed at trade in locality, 45; no difference in wages or hours between members and non-members; cash benefits, sickness, $5.40 per week; death, $100 to $200; out of work benefits, dues remitted; body incorporated. President, Samuel French, 1569 Seventh Avenue East; Corresponding Secretary, Wm. O. Cornwith, 1673 Fourth Avenue West; meets first and third Tuesdays in month.

Name,—Journeymen Stonecutters' Association of North America. Organized January, 1902; total membership, 5; average earnings per week, $21.60; average earnings per hour, 45c.; number of working hours first five days, 40; number on Saturday, 8; wages paid weekly; average number of days idle per member during

year, 120; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 5; cash benefits, death, $100; body registered. President, George A. Perkins, 820 6th Avenue West; Corresponding Secretary, Edward Gaskell 1132 4th Avenue East; meets first and third Fridays in month.

Palmerston.

Name,—Order of Railway Conductors, No. 492. Organized May 20, 1906; total membership, 8; average earnings per week, $30; average earnings per hour, 39c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; average number of days idle per member during year, none; total number (union and non-union) employed at calling in locality, 20; no difference in wages or hours between members and non-members; cash benefits, sickness, $3 per week; death, $500 to $3,000; body incorporated and registered. President, A. B. Garrietson, Cedar Rapids, Iowa; Corresponding Secretary, D. A. Cox, Box 59, Palmerston, Ont.; meets second Sunday in month.

Name,—Brotherhood of Locomotive Firemen and Enginemen (Wellington Lodge), No. 181. Organized 1883; total membership, 40; average earnings per week, $15; number of working hours first five days, paid mileage system; number on Saturday, from 5 to 24; wages paid monthly; general cause of idleness, depression of traffic; total number (union and non-union) employed at calling in locality, 50; no difference in wages and hours between members and non-members; cash benefits, death, $500 to $3,000; body incorporated and registered. President, J. Mogk, Palmerston; Corresponding Secretary, Thomas Lee, Box 115, Palmerston; meets first and third Sundays in month.

Parry Sound.

Name,—International Association of Machinists, No. 518. Organized June, 1908; total membership, 15; average earnings per week, $16; average earnings per hour, 30c.; number of working hours first five days, 50 in summer, 45 in winter; number on Saturday, 9 in summer, 5 in winter; wages paid monthly; average number of days idle per member during year, 15; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 15; no difference in wages or hours between members and non-members; cash benefits, death, $50 to $200; body incorporated. President, Leslie Nason, Parry Sound; Corresponding Secretary, Joseph Smith, Box 423, Parry Sound; meets first and third Wednesdays.

Name,—International Brotherhood of Maintenance of Way Employees, No. 447. Organized March 17, 1909; total membership, 75; average earnings per week, $11.40; average earnings per hour, 19c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 300 in summer, 80 in winter; no difference in wages or hours between members and non-members; cash benefits, superannuation; body incorporated and registered. President, J. Darling, Shawanaga P.O., Ont.; Corresponding Secretary, C. Smith, Otter Lake Station, Ont.; no regular night of meeting.

Name,—Brotherhood of Railway Trainmen, No. 759. Organized June, 1908; total membership, 60; average earnings per week, paid on mileage basis; average earnings per hour, different rates for different class of service; number of working

hours first five days, irregular; number on Saturday, irregular; wages paid monthly; average number of days idle per member during year, uncertain; general cause of idleness, depression of traffic; no difference in wages or hours between members and non-members; cash benefits, death, $500, $1,000, $1,500; body incorporated and registered. President, W. Burke, 34 Northumberland Avenue, Toronto; Corresponding Secretary, S. G. Wilkinson, Box 535, Parry Sound; meets second and fourth Sundays in month.

Pembroke.

Name,—International Brotherhood of Maintenance of Way Employees, No. 221. Total membership, 25; average earnings per week, $10.20; average earnings per hour, 17c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; difference in wages between members and non-members, 5c.; no special work for members. President, J. Murphy, Pembroke; Corresponding Secretary, A. Austin, Pembroke.

Peterborough.

Name,—United Brewery Workmen, No. 304. Organized March 6, 1910; total membership, 16; average earnings per week, $14, $13, $12.50, $11 and $10; average earnings per hour, 25c. to 20c.; number of working hours first five days, 47½; number on Saturday, 8; wages paid weekly; body registered. President, Robert Lingard, 116 Tophia Street East; Corresponding Secretary, J. C. Godfrey, Downer's Corners P.O.; meets first Tuesday in month.

Name,—Bricklayers' and Masons' International Union, No. 17. Organized November, 1901; total membership, 50; average earnings per week, $19.20; average earnings per hour, 40c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; average number of days idle per member during year, 100; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 55; difference in wages and hours of labour of those engaged at trade in locality between members and non-members, 40c. and 9 hours per day; cash benefits, death, $150 to $200. President, T. J. Parks, 539 Reid Street; Corresponding Secretary, William Stevens, Box 778, Peterborough; meets first and third Tuesdays in month.

Name,—United Brotherhood of Carpenters and Joiners, No. 672. Organized Oct. 11, 1900; total membership, 29; average earnings per week, $15; average earnings per hour, 27½c.; number of working hours first five days, 45; number on Saturday, 9; wages paid weekly; average number of days idle per member during year, 80; general cause of idleness, scarcity of work; total number (union and non-union) employed at trade in locality, 200; difference in wages or hours between members and non-members, 25c. per day; death benefits, $50 to $200; body incorporated and registered. President, Thomas Ephgrave, 610 Union Street; Corresponding Secretary, George Sloan, 518 Chamberlain Street; meets second and fourth Mondays in month.

Name,—Textile Workers of America (Carpet Weavers), No. 663. Organized January, 1908; total membership, 40; average earnings per week, male, piecework; female, $5; number of working hours first five days, 50; number on Saturday, 5; average number of days idle per member during year, 30; general cause of idleness, slackness of trade; wages paid fortnightly; total number (union and non-union) employed at trade in locality, male, 100; female, 50; difference in

wages and hours between members and non-members, same hours: rate of male outside of piece workers, $1.75 a day: death benefit, $50; body registered. President. E. Hansfield, 4 Lansdowne Street; Corresponding Secretary, Thos. Dark, care of Claraday P.O., Peterborough; meets third Mondays in month.

Name,—Federated Association of Letter Carriers, No. 22. Organized September, 1907; total membership, 12; average earnings per week, $13.50; average earnings per hour, 25c.; number of working hours first five days, 45; number on Saturday, 9: wages paid fortnightly; average number of days idle per member during year, 12; general cause of idleness, holidays; total number (union and non-union) employed at calling in locality, 13; no difference in wages or hours between members and non-members; body incorporated and registered. President, T. J. Edwards, 491 College Street; Corresponding Secretary, Robert Reid, 90 Auburn Street; meets first Wednesdays in month.

Name,—International Association of Machinists, No. 286. Total membership, 5; average earnings per week, $15; average earnings per hour, 25c. to 27½c.; number of working hours first five days, 50; number on Saturday, 5; wages paid fortnightly; no idle days; total number (union and non-union) employed at trade in locality, 300; no difference in wages or hours between members and non-members: cash benefits, sickness, $2 per week; death, $200. President, M. McConony; Corresponding Secretary, George Stenton, care of Post Office Building; meets fourth Mondays in month.

Name.—International Brotherhood of Maintenance of Way Employees, No. 211. Total membership, 55; average earnings per week, foreman, $15; labourers, $10.20; average earnings per hour, foreman, 24c.; labourers, 17c.; number of working hours first five days, 50; number on Saturday, 10: wages paid monthly: no idle days; total number (union and non-union) employed at calling in locality, 75; body incorporated and registered. President, George Spicer, Peterborough; Corresponding Secretary, George A. Tummon, Leaside, *via.* Leaside Junction; meets at call of President.

Name.—International Moulders' Union, No. 191. Organized 1874; total membership, 77: average earnings per week, $16.50; average earnings per hour, 27½c.; number of working hours first five days, 50; number on Saturday, 9 in winter, 5 in summer; wages paid weekly and fortnightly; average number of days idle per member during year, 30; general cause of idleness, depression in trade; total number (union and non-union) employed at trade in locality, 77; cash benefits, sickness, $5.40 per week; death, $100 to $200; out of work benefits, dues remitted. President, Hugh Robertson, 567 Reid Street; Corresponding Secretary, W. A. Mowry, 457 Cedar Street; meets first and third Thursdays in month.

Name.—Pattern Makers' League of North America. Organized Oct. 11, 1900; total membership, 32; average earnings per week, $17; average earnings per hour, 30c.; number of working hours first five days, 50; number on Saturday, 5; wages paid fortnightly; total number (union and non-union) employed at trade in locality, 36; cash benefits, sickness, $4 per week; death, $50 to $400. President, C. F. Browne, College Street; Corresponding Secretary, J. A. Sharp, 537 Homewood Avenue; meets second and fourth Thursdays in month.

Name,—Journeymen Tailors' Union of America, No. 23. Organized June, 1902; total membership, male, 8; female, 18; average earnings per week, male, $12; female, $7; average earnings per hour, male, 20c.; female, 15c.; number of working hours first five days, from 10 to 15; number on Saturday, from 10 to 15; wages paid weekly; general cause of idleness, slackness of trade; total number

(union and non-union) employed at trade in locality, 26; cash benefits, sickness, $5 per week; death, $25 to $100; body incorporated and registered. President, C. Strimas, Simcoe Street; Corresponding Secretary, G. A. McGee, 516 Water Street; meets every fourth Tuesday in month.

Name,—International Typographical Union, No. 248. Organized January, 1902; total membership, 44; average earnings per week, $14; average earnings per hour, 29 1-6c.; number of working hours first five days, 40; number on Saturday, 8; wages paid weekly; no idle days; cash benefits, death, $75 to $400; superannuation, $4 per week; special work for members, classes conducted by I.T.U.; body incorporated. President, James P. Dillon, 303 Mark Street; Corresponding Secretary, J. M. Galbraith, 125 Brock Street; meets first Saturday in month.

Porcupine.

Name,—Western Federation of Miners, No. 145. Organized April 23, 1910; total membership, 900; average earnings per week, $20; average earnings per hour, 32c.; number of working hours first five days, 45; number on Saturday, 9; wages paid monthly; average number of days idle per member during year, 180; general cause of idleness, the present competitive system; total number (union and non-union) employed at calling in locality, 1,200; cash benefits, sickness, $1 per diem; death, $50 and up; library for use of members. President, James Dogue, Box 521; Corresponding Secretary, James D. Cluney, Box 521, South Porcupine; meets Sundays.

Port Arthur.

Name,—Bartenders' International League of America, No. 757. Total membership, 46; average earnings per week, $15.50; number of working hours first five days, 40; number on Saturday, 6; wages paid monthly; total number (union and non-union) employed at calling in locality, 46; all are members of organization; cash benefits, sickness, $5 per week; death, $50; body incorporated and registered. President, J. H. Walker, care of Vendome Hotel; Corresponding Secretary, L. Beninger, care of Union Hotel; meets first and third Sundays in month.

Name,—Amalgamated Society of Carpenters and Joiners, No. 865. Organized August 10, 1910; total membership, 25; average earnings per week, $24; average earnings per hour, 40c.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly; cash benefits, sickness, $3 per week; death, $60; superannuation, $2 per week; out of work benefits, $2.50 per week; body incorporated and registered. President, Percy Manning, 42 Ontario Street; Corresponding Secretary, W. D. Mantle, 176 Banning Street; meets second and fourth Mondays in month.

Name,—United Brotherhood of Carpenter and Joiners, No. 258. Organized 1896; total membership, 45; average earnings per week, $24; average earnings per hour, 40c.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly; average number of days idle per member during year, 100; general cause of idleness, lack of work in winter; total number (union and non-union) employed at trade in locality, 200; difference in wages or hours of labour of those engaged at trade in locality between members and non-members of organization, non-union from 27½c. to 35c. per hour; union, 40c. per hour; cash benefits, death, $50 to $500; body incorporated and registered. President,

W. Robertson, 91 Crown Street; Corresponding Secretary, R. L. Srigley, 255 College Street; meets first and third Mondays in month.

Name,—International Brotherhood of Electrical Workers, No. 367. Organized Dec. 1, 1911; total membership, 30; average earnings per week, $21; average earnings per hour, 39c. to 40c.; number of working hours first five days, 50; number on Saturday, 4; wages paid fortnightly; no idle days; total number (union and non-union) employed at calling in locality, 40; no difference in wages or hours between members and non-members; body incorporated. President, Alexander McCrae, Western Hotel, North Cumberland Street; Corresponding Secretary, Charles Lambert, 125 Algoma Street South; meets second and fourth Wednesdays in month.

Name,—Canadian Association of Stationary Engineers, No. 29. Organized May, 1911; total membership, 27; average earnings per week, $20; average earnings per hour, 33 1-3c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; total number (union and non-union) employed at trade in locality, 75; no difference in wages or hours between members and non-members; body incorporated and registered. President, John Insley, 370 Dufferin Street; Corresponding Secretary, S. Smith, 506 Van Norman Street; meets first and third Fridays in month.

Name,—Federal Labour Union, No. 14,135. Organized Oct. 6, 1911; total membership, 187; average earnings per week, $12.50; average earnings per hour, 22½c.; number of working hours first five days, 50; number on Saturday, 10; wages paid weekly, fortnightly and monthly; no difference in wages or hours between members and non-members; body incorporated. President, Herbert Barker, 157 Pine Street; Corresponding Secretary, Arch. Logan, 68 Burris Street; meets first and third Fridays in month.

Name,—Longshoremens' International Association (Coal Handlers), No. 319. Organized March 18, 1911; total membership, 145; average earnings per week, $12; average earnings per hour, 25c.; number of working hours first five days, varies; number on Saturday, varies; wages paid monthly; average number of days idle per member during year, 125; general cause of idleness, close of navigation; total number (union and non-union) employed at calling in locality, 175; no difference in wages or hours between members and non-members; body incorporated and registered. President, M. Pents, 337 Ambrose Street; Corresponding Secretary, George Ross, 600 McIntosh; meets first and third Sundays in month.

Name,—International Association of Machinists, No. 820. Organized April, 1908; total membership, 15; average earnings per week, $23; average earnings per hour, 37½c.; number of working hours first five days, 40; number on Saturday, 5; wages paid weekly and monthly; no idle days; total number (union and non-union) employed at trade in locality, 50; difference in wages or hours between members and non-members, 15c.; cash benefits, death, $50 to $300; out of work benefits, dues remitted. President, Robert Christie, 270 Algoma Street; Corresponding Secretary, Andrew Boyd, 368 Wiley Street; meets third Tuesday in month.

Name,—United Association of Plumbers and Steamfitters, No. 378. Organized July, 1910; total membership, 16; average earnings per week, $22; average earnings per hour, 50c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; average number of days idle per member during year, 60; general cause of idleness, slackness of trade; total number (union and non-union) employed at trade in locality, 30; difference in wages and hours of labour of those engaged at trade in locality between members and

non-members of organization, 10c. to 15c. per hour, and 9 hours per day; cash benefits, sickness, $5 per week; death, $100; out of work benefits, dues remitted; body incorporated and registered. President, George Bell, Machar Avenue; Corresponding Secretary, William Davie, Elm Street; meets second and fourth Fridays in month.

Name,—Journeymen Stonecutters of North America. Organized Dec. 5, 1853; total membership, 16; average earnings per hour, 60c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, six months; general cause of idleness, winter weather and slackness in trade; total number (union and non-union) employed at trade in locality, 16; death benefits, $100; body incorporated and registered. President, M. King, Algonquin Avenue; Corresponding Secretary, Robt. Paton, Empire Avenue; meets second and fourth Tuesdays in month.

Name,—International Typographical Union, No. 575. Organized Oct. 1, 1907; total membership, 25; average earnings per week, $20.72; average earnings per hour, 43 1-6c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; total number (union and non-union) employed at trade in locality, 25; no difference in wages or hours between members and non-members; cash benefits, sickness, $5 per week; death, $75 to $400; superannuation, $5 per week after 60 years of age; no special work for members. President, H. E. Lawrence, Centre Street; Corresponding Secretary, T. H. Wynn, 501 Van Norman Street; meets second Tuesday in month.

Preston.

Name,—International Moulders' Union, No. 314. Organized May 10, 1900; total membership, 105; average earnings per week, $18; average earnings per hour, 27½c.; wages paid weekly; average number of days idle per member during year, 50; general cause of idleness, trade conditions; total number (union and non-union) employed at trade in locality, 145; no difference in wages or hours between members and non-members; cash benefits, sickness, $5.40 per week; death, $100 to $200; out of work benefits, dues remitted. President, John Doyle, Preston; Corresponding Secretary, T. J. Parker, Box 85, Preston; meets first and third Wednesdays in month.

Name,—Metal Polishers, Buffers, Platers and Brass Workers' International Union, No. 27. Total membership, 17; number of working hours first five days, 50; number on Saturday, 5 in summer, 9 in winter; death benefits, $50 to $200; body incorporated and registered. President, A. Wright, Preston, P. O.; Corresponding Secretary, F. A. Schartzberg, Box 374; meets third Tuesdays in month.

Name,—Stove Mounters' International Union, No. 11. Organized Oct. 20, 1911; total membership, 21; average earnings per week, $15; average earnings per hour, 25c.; number of working hours first five days, 50; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 36; general cause of idleness, depression in trade; total number (union and non-union) employed at trade in locality, 21; all are members of organization; cash benefits, death, $100; out of work benefits, dues remitted. President, Frank Hemming, Preston; Corresponding Secretary, John A. Tobin, Preston; meets first and third Fridays in month.

Rainy River.

Name,—Brotherhood of Railway Carmen, No. 436. Organized Oct. 5, 1911; total membership, 20; average earnings per week, $14; average earnings per hour,

26c.; number of working hours first five days, 50; number on Saturday, 5 from April to October, after that 9; wages paid monthly; average number of days idle per member during year, 14; general cause of idleness, sickness and lack of work; total number (union and non-union) employed at calling in locality, 20. all union; no difference in wages or hours between members and non-members; body incorporated and registered. President, W. F. Crackie, Rainy River; Corresponding Secretary, B. J. Franks, Box 49, Rainy River; meets 20th of each month.

Name,—Order of Railway Conductors, No. 30. Organized March 1, 1910; total membership, 38; average earnings per week, mileage basis; wages paid monthly; general cause of idleness, business slack; total number (union and non-union) employed at calling in locality, 45; no difference in wages or hours between members and non-members; cash benefits, death, amount of insurance; body incorporated. President, A. B. Garretson, Cedar Rapids, Iowa; Corresponding Secretary, S. McElroy, Box 129, Rainy River, Ont.; meets first and third Sunday in month.

Name,—Brotherhood of Locomotive Firemen and Enginemen, No. 750. Organized July 12, 1908; total membership, 54; average earnings per week, $18; average earnings per hour, 30c.; number of working hours first five days, no limit; number on Saturday, no limit; wages paid monthly; general cause of idleness, condition of trade; total number (union and non-union) employed at calling in locality, 62; no difference in wages or hours between members and non-members; cash benefits, death, amount of insurance; body incorporated and registered. President, A. L. Campbell, Box 152, Rainy River; Corresponding Secretary, William Douglas, Box 189, Rainy River; meets second and fourth Thursdays in month.

Richmond Hill.

Name,—Order of Railroad Telegraphers. Total membership, 30; average earnings per week, $16; average earnings per hour, 20c.; number of working hours first five days, 60; number on Saturday, 12; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 36; no difference in wages or hours between members and non-members; cash benefits, death, $300, $500, $1,000; body incorporated and registered. President, H. B. Perham, Star Building, St. Louis, Mo.; Corresponding Secretary, E. Fisk, 330 Montrose Avenue, Toronto; meets at call of Chairman.

St. Catharines.

Name,—Barbers' Union, No. 1. Organized 1886; total membership, 24; average earnings per week, $13; average earnings per hour, 17½c.; number of working hours first five days, 60; number on Saturday, 16; wages paid weekly; total number (union and non-union) employed at trade in locality, 28; cash benefits, sickness, $3 per week; death, $25. President, Harry Stutt, St. Paul Street; Corresponding Secretary, Adam Haynes, 293 St. Paul Street; meets first and third Mondays in month.

Name,—International Brewery Workers of America, No. 305. Organized Jan. 1, 1910; total membership, 19; average earnings per week, $11; average per hour, 20c.; number of working hours first five days, 45; number on Saturday, 9; wages paid weekly; total number (union and non-union) employed at trade in locality, 19. President, George Wiley, Cherry Street; Corresponding Secretary, Robert Hall, 4 Thomas Street; meets third Friday in month.

Name,—Bricklayers', Masons' and Plasterers' International Union, No. 4. Organized June 6, 1882; total membership, 73; average earnings per week, $16.50; average earnings per hour, 48c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 85; general cause of idleness, weather conditions; total number union and non-union) employed at trade in locality, 75; no difference in wages or hours between members and non-members; cash benefits, death, $50 to $200; recreation room during winter months. President, J. A. Rowder, 11 Raymond Street; Corresponding Secretary, C. G. Patey, 48 Louisa Street; meets first and third Tuesdays in month.

Name,—Amalgamated Society of Carpenters and Joiners, Branch No. 867. Organized June 4, 1860; total membership, 15; average earnings per week, $17.50; average earnings per hour, 35c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 40; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 150; difference in wages or hours between members and non-members, non-union usually get 10c. per hour less than union men and have no stated hours of labour; cash benefits, sickness, $3 per week; death, $60; superannuation, $2 per week for life after 60 years of age; loss of tools by theft or fire, $75; accident benefit, $500 if a member over 3 years; body incorporated and registered. President, W. H. C. Nicholson, 19 Wiley Street; Corresponding Secretary, J. Atkinson, 41 Elizabeth Street; meets alternate Thursdays in month.

Name,—United Brotherhood of Carpenters and Joiners of America, No. 38. Organized February, 1883; total membership, 100; average earnings per week, $17.50; average earnings per hour, 35c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly and fortnightly; average number of days idle during year, 15; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 115; difference in wages and hours between members and non-members, union, 50 hours; non-union, 60 and more; union, 35c.; non-union, 25c. and 30c. and even less; cash benefits, death, $200; disability, $400. President, John B. Dunklee, 35 George Street; Corresponding Secretary, James Carty, 19 Cherry Street; meets every Friday in month.

Name.—Cigarmakers' International Union, No. 140. Organized August 24, 1881; total membership, male, 25; female, 1; average earnings per week, male, $12; female, $12; average earnings per hour, male, 25c.; female, 25c.; number of working hours first five days, 40; number on Saturday, 8; wages paid weekly, no idle days; total number (union and non-union) employed at trade in locality, male, 25; female, 1; all are members of organization; cash benefits, sickness, $5 per week; death, $50 to $550; death of wife or mother, $40; out of work benefits, $3 per week; body incorporated and registered. President, Wilfred Haynes, 13½ Cherry Street; Corresponding Secretary, L. T. Coyle, 3 Court Street; meets first Saturday in month.

Name,—Federated Association of Letter Carriers, No. 17. Organized Sept. 13, 1908; total membership, 9; average earnings per week, $12; number of working hours first five days, 45; number on Saturday, 9; wages paid fortnightly; no idle days; total number (union and non-union) employed at calling in locality, 10; body incorporated. President, R. Gare, 208 Niagara Street; Corresponding Secretary, F. S. Whitten, 65 Ontario Street; meets last Fridays in month.

Name,—International Association of Machinists, No. 268. Organized 1899; total membership, 38; average earnings per week, $16; average earnings per hour, 30c.; number of working hours first five days, 50; number on Saturday, 8½; wages paid fortnightly; no idle days; total number (union and non-union) employed at trade in locality, 55; death benefits, $200; out of work benefits, dues remitted. President, Frank Lynox, 17 Elizabeth Street; Corresponding Secretary, John A. Rothwell, 58 Lake Street; meets second Mondays in month.

Name,—International Moulders' Union of North America, No. 385. Organized Dec. 5, 1905; total membership, 33; average earnings per week, male, $18; female, $5; average earnings per hour, 30c.; number of working hours first five days, 50; number on Saturday, 5; wages paid weekly and fortnightly; general cause of idleness, depression in trade; total number (union and non-union) employed at trade in locality, male, 160; female, 20; difference in wages and hours between members and non-members, 25c.; cash benefits, sickness, $5.40 per week; death, $200; out of work benefits, dues remitted. President, Harry Grey, 47 Queenston Street; Corresponding Secretary, Fred Keene, 39 Albert Street; meets second Friday in month.

Name,—Brotherhood of Painters, Decorators and Paperhangers, No. 407. Organized Aug. 1, 1901; total membership, 48; average earnings per week, $12 to $15; average earnings per hour, 35c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 60 to 100; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 52; difference in wages or hours between members and non-members, not much difference in hours; from 2c. to 5c. in wages; death benefits, $100 to $300; body incorporated. President, E. A. Day, George Street; Corresponding Secretary, W. D. Outram, 30 Nelson Street; meets second and fourth Wednesdays in month.

Name,—United Association of Plumbers, Gas Fitters, Steam Fitters, etc., No. 244. Organized April 1, 1901; total membership, 26; average earnings per week, $15; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 14; general cause of idleness, depression in trade; total number (union and non-union) employed at trade in locality, 26; cash benefits, sickness, $5 per week; death, $100; superannuation, $100. President, B. A. Price, 61 George Street; Corresponding Secretary, Harry Oliver, 31 Beech Street; meets every Thursday in month.

Name,—Metal Polishers, Buffers, Platers and Brass Workers' International Union of America, No. 97. Organized 1902; total membership, 16; average earnings per week, polishers, $16.50; buffers, $15; average earnings per hour, 26c. to 28½c.; number of working hours first five days, 50; number on Saturday, 5 for July and August; 8 balance of year; wages paid weekly and fortnightly; average number of days idle per member during year, 30; general cause of idleness, slackness in trade; total number (union and non-union) employed at trade in locality, 35; no difference in wages or hours between members and non-members; cash benefits, death, $50 to $200; out of work benefits, dues remitted. President, Lorne Tufford, 29 Catharine Street; Corresponding Secretary, W. Bowen, 29 Henry Street; meets first and third Fridays in month.

Name,—Journeymen Tailors' Union of America, No. 235. Organized August, 1896; total membership, male, 22; female, 12; average earnings per week, male, $15; female, $7; average earnings per hour, male, 25c.; female, 15c.; number of

working hours first five days, 50; number on Saturday, 10; wages paid weekly; average number of days idle per member during year, 60; general cause of idleness, slack season; total number (union and non-union) employed at trade in locality, male, 26; female, 15; no difference in wages or hours between members and non-members; cash benefits, sickness, $5 per week; death, $25 to $100. President, F. J. Coyle, Grand Central Hotel, St. Paul Street.

Name,—International Typographical Union, No. 416. Total membership, 20; average earnings per week, $15; average earnings per hour, 31½ c.; number of working hours first five days, 42½; number on Saturday, 5½; wages paid weekly; total number (union and non-union) employed at trade in locality, 20; all organized; cash benefits, death, $400; superannuation, $5 per week; body incorporated. President, W. J. Thompson, "Standard" Office; Corresponding Secretary, D. Marshall, 33 Henry Street; meets last Monday in month.

St. Mary's.

Name, Journeymen Stonecutters' Association of North America. Organized 1905; total membership, 4; average earnings per week, $21.60; average earnings per hour, 45c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; average number of days idle per member during year, 90; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 4; all are members of organization; cash benefits, death, $100; body incorporated and registered. President, Alex. Craig, General Delivery, St. Mary's; Corresponding Secretary, W. H. McCauley, General Delivery, St. Mary's; no set date of meeting at present.

St. Thomas.

Name, Brotherhood of Boilermakers of America, No. 413. Organized October, 1907; total membership, 40; average earnings per week, $17.60; average earnings per hour, 31¾c.; number of working hours first five days, 45 and 50; number on Saturday, 5 and 10; wages paid monthly; no idle days; total number (union and non-union) employed at trade in locality, 60; difference in hours of labour of those engaged at trade in locality between members and non-members, non-union work 10 hours and union 9 hours per day; cash benefits, death, $100; no special work for members. President, Cornelius Doxey, St. Thomas; Corresponding Secretary, W. McGillivray, 20 Hemlock Street; meets second and fourth Tuesdays in month.

Name,—Brotherhood of Boilermakers and Helpers, No. 5. Organized July 17, 1912; total membership, 30; average earnings per week, $11; average earnings per hour, 20c.; number of working hours first five days, 45; number on Saturday, 9; wages paid monthly; total number (union and non-union) employed at trade in locality, 50; difference in wages or hours between members and non-members, union men receive from 1c. to 3c. per hour more than non-union men. President, Ernest May, 30 Maple Street; Corresponding Secretary, F. Dunworth, 30 Maple Street; meets first and third Wednesdays in month.

Name,—Bricklayers', Masons' and Plasterers' Union, No. 8. Organized 1885; total membership, 34; average earnings per week, $23.60; average earnings per hour, 42c.; number of working hours first five days, 45; number on Saturday, 9; wages paid fortnightly; average number of days idle per member during year, 90; general cause of idleness, winter weather; difference in hours of labour between

members and non-members, non-union work 10 hours, union 9 hours: cash benefits, death, $100 to $300; body incorporated and registered. President, Charles Heard, 35 Hincks Street; Corresponding Secretary, Orlando Beal, 83 Erie Street; meets second and fourth Wednesdays in month.

Name, Cigarmakers' International Union of America, No. 420. Organized 1899; total membership, male, 9; female, 1; average earnings per week, male, $10 to $15; female, $8; number of working hours first five days, 40; number on Saturday, 4 to 5; wages paid weekly; total number (union and non-union) employed at trade in locality, male, 15; female, 8; difference in wages or hours between members and non-members, females get $6 per week and work 9 hours per day; cash benefits, sickness, $5 per week; out of work benefits, $3 per week; body registered. President, G. Haslam, Curtis Street; Corresponding Secretary, Fred. Roberts, 4 Balfour Street; meets first Friday and third Saturday in month.

Name,—Order of Railway Conductors (Union Division), No. 13. Organized 1882; total membership, 100; average earnings per week, $25; average earnings per hour, 36c.; number of working hours first five days, full time, number on Saturday, full time; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 150; no difference in wages or hours between members and non-members; cash benefits, sickness, $5 and $10 per week; death, amount of insurance; body registered. President, E. Adderman, 124 Centre Street; Corresponding Secretary, K. Hastings, 48 Southwark Street; meets second and fourth Sundays in month.

Name,—Brotherhood of Locomotive Engineers, Air Line Sub-Division No. 529. Organized 1904; total membership, 54; average earnings per week, $23.40; average earnings per hour, 39c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; average number of days idle per member during year, 30; general cause of idleness, engines which we are assigned to laid up; total number (union and non-union) employed at calling in locality, 55; no difference in wages or hours between members and non-members; body incorporated and registered. President, John McGregor, Yardwood Street; Corresponding Secretary, A. H. Martin, 52 Manitoba Street; meets every Tuesday at 2 p.m.

Name,—Brotherhood of Locomotive Engineers, No. 661. Organized Nov. 13, 1904; total membership, 40; average earnings per week, mileage basis; average earnings per hour, 40c.; number of working hours first five days, varies; number on Saturday, varies; wages paid monthly; general cause of idleness, dullness of trade; total number (union and non-union) employed at calling in locality, 65; no difference in wages or hours between members and non-members; cash benefits, death, $750 to $4,500. President, Chas. L. Wilson, 43 Southwick Street; Corresponding Secretary, H. W. Buckpitt, 45 Mitchell Street; meets every Wednesday in month.

Name,—Amalgamated Society of Engineers, No. 713. Organized Jan. 1, 1851; total membership, 10; average earnings per week, $18.60; average earnings per hour, 34½c.; number of working hours first five days, 45; number on Saturday, 9; wages paid monthly; cash benefits, sickness, $2.50 per week; death, $60; superannuation, $2.50 per week; out of work benefits, $2.50 per week; body incorporated and registered. President, R. Edleston, 1 Smith Avenue; Corresponding Secretary, William Young, 56 Arthur Avenue; meets fortnightly.

Name,—Brotherhood of Locomotive Firemen and Enginemen, No. 5. Total membership, 315; average earnings per week, mileage basis; average earnings per

hour, 22c. to 29½c.; number of working hours first five days, mileage basis; number on Saturday, mileage basis; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 325; no difference in wages or hours between members and non-members; cash benefits, sickness, $10 per week; death, $500 to $3,000; superannuation, 1 per cent. of yearly earnings for last 10 years multiplied by total years of calling; body incorporated and registered. President, J. P. O'Dell, 110 Forest Avenue; Corresponding Secretary, W. W. Scott, 24 Maple Street; meets Fridays at 2 p.m.

Name, Federated Labour Union (Gas Workers), No. 13,144. Organized July; total membership, 20; average earnings per week, $13; average earnings per hour, 24c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; no idle days; no difference in wages or hours between members and non-members. President, C. Boxall; Corresponding Secretary, William Stokes, 69 Flora Street; meets first Wednesday in month.

Name,—International Association of Machinists, No. 294. Reorganized July 18, 1907; total membership, 150; average earnings per week, $15; average earnings per hour, 34½c.; number of working hours first five days, 45; number on Saturday, 9; wages paid monthly; average number of days idle per member during year, 30; general cause of idleness, retrenchment plan of company; total number (union and non-union) employed at trade in locality, 175; difference in wages of those engaged at trade in locality, union 34½c.; per hour; non-union, 28c. per hour; cash benefits, sickness, optional with local; death, $250; out of work benefits, dues remitted; strike pay, married men, $8 per week; single men, $6 per week; special work for members, lectures on meeting nights and a monthly educational journal. President, Archie Vecary, Dake House, Talbot Street; Corresponding Secretary, J. J. J. Stewart, 56 Redan Street; meets first and third Tuesdays in month.

Name,—Machinists' Helpers and Labourers (F. L. U.), No. 12,906. Organized October, 1909; total membership, 40; average earnings per week, $10; average earnings per hour, 19c.; number of working hours first five days, 45; number on Saturday, 9; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 40; no difference in wages or hours between members and non-members; body incorporated and registered. President, Jas. Wilson, Barnes Street; Corresponding Secretary, Frank Teetzel, 32 Chester Street; meets first and third Mondays in month.

Name,—International Brotherhood of Maintenance of Ways Employees. Organized Aug. 1, 1911; total membership, 200; average earnings per week, $10; average earnings per hour, 16½c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; general cause of idleness, reduction of men in winter months; total number (union and non-union) employed at calling in locality, 400; no difference in wages or hours between members and non-members; cash benefits, superannuation, after 10 years of continuous service we receive 1 per cent. per year of our average pay for the last 10 year; body incorporated and registered. Meets second and fourth Thursday in month.

Name,—International Association of Steam and Hot Water Fitters and Helpers of America, No. 107. Organized April, 1910; total membership, 9; average earnings per week, $15; average earnings per hour, 25c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; average number of days idle per member during year, 20; total number (union and non-union) employed at trade in locality, 20; no difference in wages or hours

between members and non-members; death benefits, $50 to $150; body incorporated and registered. President, C. M. Doritty, 8 Maple Street; Corresponding Secretary, A. G. Stacey, 90 Forest Avenue; meets first and third Wednesdays in month.

Name,—International Union of Printing Pressmen, No. 129. Organized 1909; total membership, 5; average earnings per week, $14; average earnings per hour, 29c.; number of working hours first five days, 40; number on Saturday, 8; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 5; all are members of organization; death benefit, $100. President, H. Colleage; Corresponding Secretary, Frederick Hardy, 35 Alexandra Avenue; meets second Monday in month.

Name,—Brotherhood of Railway Signalmen of America. Organized June, 1911; total membership, 61; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; total number (union and non-union) employed at calling in locality, 67; no difference in wages or hours between members and non-members. President, W. L. Follis, 44 Erie Street; Corresponding Secretary, L. Hoover, Ridgetown; meets first Thursday after 10th of each month.

Name,—Journeymen Tailors' Union of North America, No. 141. Organized 1890; total membership, male, 17; female, 20; average earnings per week, male, $12; female, $7; average number of days idle per member during year, 60; general cause of idleness, slackness of trade; total number (union and non-union) employed at trade in locality, male, 25; female, 32; difference in wages or hours between members and non-members, union receive from $2 to $5 per week more than non-union; cash benefits, sickness, $5 per week; death, $25 to $100. President, Frank Garrow, Jackson Street; Corresponding Secretary, Wm. Abernethy, 30 Ross Street; meets fourth Mondays in month.

Name,—Brotherhood of Railway Trainmen, No. 47. Organized April 21, 1887; total membership, 370; average earnings per week, paid on mileage basis; conductors, $3.63 per 100 miles, or 10 hours per day; brakemen, $2.42 per 100 miles, or 10 hours per day; wages paid monthly; average number of days idle per member during year, uncertain; general cause of idleness, depression in traffic; total number (union and non-union) employed at calling in locality, 400; no difference in wages or hours between members and non-members; cash benefits, sickness, $5 and $10 per week; death, $500, $1,000, $1,500; body incorporated and registered. President, A. E. Hookway, 638 Talbot Street; Corresponding Secretary, H. Sharp, 2 John Street; meets every Monday in month.

Name,—International Typographical Union, No. 459. Organized 1895; total membership, male, 26; female, 1; average earnings per week, male, $16; female, $15; average earnings per hour, 33⅓c. male; 31⅓c. female; number of working hours per week, 48; wages paid weekly; no idle days; all are members of organization; death benefits, $75 to $400. President, Chas. Reid, Hamilton Street; Corresponding Secretary, Robert Porter, 8 Drake Street; meets second Monday in month.

Sarnia.

Name,—Journeymen Barbers' International Union, No. 467. Organized December, 1902; total membership, 15; average earnings per week, $14; average earnings per hour, 19 2-3c.; number of working hours first five days, 56; number on Saturday, 15; wages paid weekly; no idle days; total number (union and non-

union) employed at calling in locality, 18; difference in wages or hours between members and non-members, non-members work 10 hours longer per week; about $2 per week less than union men; cash benefits, sickness, $5 per week; death, $75 to $500. President, Murray Jaynes, 143 Front Street; Corresponding Secretary, Wm. Knight, 140 Cromwell Street; meets first Tuesdays in month.

Name,—Bricklayers', Masons' and Plasterers' International Union, No. 23. Organized December, 1902; total membership, 19; average earnings per week, $18; average earnings per hour, 50c.; number of working hours first five days, 45; number on Saturday, 9; wages paid weekly and fortnightly; average number of days idle per member during year, 90; general cause of idleness, unfavourable weather and lack of material; total number (union and non-union) employed at trade in locality, 19; body registered. President, Henry Walton, Cromwell Street; Corresponding Secretary, R. B. Murray, 119 North Gritton Street; meets first and third Mondays in month.

Name,—Brotherhood of Railway Carmen of America, No. 295. Organized May 10, 1912; total membership, 19; average earnings per hour, 19c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; total number (union and non-union) employed at trade in locality, 24; no difference in wages or hours between members and non-members. President, Donald Campbell, 321 Russell Street; Corresponding Secretary, A. Baker, 401 George Street; meets last Monday in month.

Name,—Order of Railway Conductors, No. 189. Organized April 27, 1886; total membership, 47; average earnings per week, $25; no regular hours; called when required; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 65; no difference in wages or hours between members and non-members of organization; cash benefits, death, $1,000 to $3,000; superannuation, pension by G. T. R.; body incorporated and registered. President, John W. Weston, 127 Vidal Street; Corresponding Secretary, H. Bell, 288 Campbell Street; meets first and third Tuesdays in month.

Name,—Brotherhood of Locomotive Engineers, No. 240. Organized Jan. 18, 1884; total membership, 89; average earnings per week, $30 to $35; wages paid monthly; total number (union and non-union) employed at calling in locality, 105; no difference in wages or hours between members and non-members; cash benefits, death, amount of insurance; body incorporated and registered. President, Henry Steel, Shepherd Street; Corresponding Secretary, Jas. Copeland, 140 Savoy Street; meets alternate Thursdays in month.

Name,—Brotherhood of Locomotive Firemen and Enginemen, No. 221. Organized 1873; total membership, 110; average earnings per week, mileage basis; average earnings per hour, mileage basis; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 120; no difference in wages and hours between members and non-members; death benefit, amount of insurance. President, Geo. Harris, 258 South Brock Street; Corresponding Secretary, H. J. Setterley, 442 Confederation Street; meets first and third Tuesdays in month.

Name,—Federated Association of Letter Carriers, No. 31. Organized November, 1909; total membership, 2; average earnings per week, $13.50; average earnings per hour, 25c.; number of working hours first five days, 40; number on Saturday, 8; wages paid fortnightly; no idle days; total number (union and non-union) employed at calling in locality, 9; no difference in wages or hours between members and non-members; body incorporated. President, Chas. Duncan, Corresponding Secretary, A. A. Bowles, Sarnia.

Name,—Longshoremen's International Association, No. 253. Organized Aug. 22, 1910; total membership, 50; average earnings per week, $12; average earnings per hour, 30c.; number of working hours first five days, 50; number on Saturday, 10; wages paid on completion of job: average number of days idle per member during year, 90; general cause of idleness, winter weather; total number (union and non-union) employed at calling in locality, 150; difference in wages between members and non-members, 15c. per hour; body incorporated and registered. President, David Harrison, 246 River Street; Corresponding Secretary, B. Shultz, 246 River Street; meets first and third Fridays in month.

Name,—Brotherhood of Railway Trainmen, No. 227. Organized 1883; total membership, 155; wages paid monthly; total number (union and non-union) employed at calling in locality, 120: no difference in wages or hours between members and non members; death benefit, $1,500; body registered. President, W. W. Melick, Wellington Street; Corresponding Secretary, D. McEachan, 125 Margaret Street: meets first and third Mondays in month.

Sault Ste. Marie.

Name,—Amalagamated Society of Carpenters and Joiners, Branch No. 869. Organized August 10, 1911: total membership, 100; average earnings per week, $20; average earnings per hour, 35c.; number of working hours first five days, 50; number on Saturday, 10: wages paid fortnightly; average number of days idle per member during year, one or two months; general cause of idleness, winter weather; no difference in wages or hours between members and non-members: cash benefits, sickness, $3 per week; death, $60; superannuation, $2 per week; out of work benefits, $2 to $3 per week; body registered. President, E. D. Pittam, Box 377; Corresponding Secretary, J. Breeze, Box 777; meets first and third Mondays in month.

Name,—International Union of Wood, Wire and Metal Lathers, No. 191. Organized Aug. 7, 1911; total membership, 10; average earnings per week, $24; average earnings per hour, 40c.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly; average number of days idle per member during year, 90; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 12; no difference in wages or hours between members and non-members; body registered. President, John Bullock, 49 Borron Avenue, Pim Hill; Corresponding Secretary, John W. Bullock, 49 Borron Avenue, Pim Hill; meets first Fridays in month.

Name,—Brotherhood of Locomotive Firemen and Enginemen, No. 606. Organized 1873; total membership, 40; average earnings per week, $25; wages paid monthly; total numbr (union and non-union) employed at calling in locality, 40; no difference in wages or hours between members and non-members; death benefits, $500 to $3,000; body incorporated and registered. President, J. Reilly, 508 Wellington Street; Corresponding Secretary, T. J. Rolph, Church Street; meets second Wednesday in month.

Name,—International Brotherhood of Maintenance of Way Employes, No. 269. Organized 1899; total membership, 40; average earnings per week, foremen, $14.70; labourers, $10.50; average earnings per hour, foremen, 24½c.; labourers, 17½c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; no difference in wages or hours between members and non-members; death benefit, $200 to $1,000. President, W. Warmsley, Echo

Bay; Corresponding Secretary, W. J. Jewkes, 269 Bruce Street, Sault Ste. Marie; meets last Saturday in month.

Name,—Moulders' International Union of North America. No. 391. Organized Sept. 23, 1906; total membership, 20; average earnings per week, $19; average earnings per hour, 31½c. and 32c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; total number (union and non-union) employed at trade in locality, 35; difference in wages between members and non-members, non-union are paid on an average of 30c. per hour; cash benefits, sickness, $5.40 per week; death, $100; out of work benefits, dues remitted; body incorporated and registered. President, James Darrance, Bruce Hill; Corresponding Secretary, E. Spence, 150 Murray Street; meets third Friday in month.

Name,—United Association of Plumbers, Steam Fitters, etc., No. 414. Organized June 25, 1910; total membership, 15; average earnings per week, $22.50; average earnings per hour, 45c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; total number (union and non-union) employed at trade in locality, 22; cash benefits, sickness; $5 per week; death, $100; body incorporated and registered. President, Hugh Paterson, Queen Street; Corresponding Secretary, J. S. Dew, 131 Treburn Avenue; meets second and fourth Thursdays in month.

Schreiber.

Name,—Brotherhood of Locomotive Firemen and Enginemen, No. 387 (Red Rock Lodge); total membership, 70; average earnings per week, $22.50 to $30; average earnings per hour, 29c. to 33c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; general cause of idleness, slackness in trade; total number (union and non-union) employed at calling in locality, 60; no difference in wages or hours between members and non-members; cash benefits, death, $1,000 to $3,000, according to amount of insurance; special work for members, C.P.R. furnish instruction car once or twice a year; body incorporated and registered. President, William Hughes, Box 12, Schreiber; Corresponding Secretary, E. E. Cambridge, Box 173, Schreiber; meets first Sunday and Third Wednesday in month.

Name,—International Association of Machinists, No. 69. Organized Jan. 2, 1912, total membership, 20; average earnings per hour, 39c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; average number of days idle per member during year, 10; general cause of idleness, holidays; total number (union and non-union) employed at trade in locality, 20; cash benefits, death, $50 to $300; out of work benefits, dues remitted. President, William Lister, Schreiber; Corresponding Secretary, Frank Kastner, Schreiber; meets second and fourth Thursdays in month.

Name,—International Brotherhood of Maintenance of Way Employes, No. 260. Organized August, 1904; total membership, 50; average earnings per week, $13.30; average earnings per hour, 19c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; total number (union and non-union) employed at calling in locality, 600; no difference in wages or hours between members and non-members; death benefits, amount of insurance; body registered. President, C. Erickson, Schreiber P.O.; Corresponding Secretary, W. Sparks, Schreiber P.O.; meets last Sunday in month.

Silver Centre.

Name.—Western Federation of Miners, No. 148. Organized Sept. 25, 1910; total membership, 90; average earnings per week, $18; average earnings per hour, 35c.; number of working hours first five days, 45; number on Saturday, 9; wages paid monthly; average number of days idle per member during year, 100; general cause of idleness, breakage of machinery, sickness, etc.; total number (union and non-union) employed at calling in locality, 110; no difference in wages or hours between members and non-members; cash benefits, sickness, $7 per week; death, $50; reading room, and gymnasium for members; body incorporated and registered. President, H. J. Murphy, Silver Centre; Corresponding Secretary, Jos. E. Redmond, Silver Centre; meets Sunday, 2 p.m.

Simcoe.

Name,—International Brotherhood of Maintenance of Way Employees, No. 217. Total membership, 45; average earnings per week, foremen, $14.40; labourers, $10.20; average earnings per hour, foremen, 24c.; labourers, 17c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; no difference in wages or hours between members and non-members; body incorporated and registered. President, A. B. Lowe, Vanol Building, 3900 Olive Street, St. Louis, Mo.; Corresponding Secretary, R. Treadwell, Midhurst, Ontario; meets once every three months.

Smith's Falls.

Name,—Bricklayers', Masons' and Plasterers' International Union of America, No. 21. Organized November, 1902; total membership, 32; average earnings per week, $24.30; average earnings per hour, 45s.; number of working hours first five days, 45; number on Saturday, 9; wages paid fortnightly; average number of days idle per member during year, 150; general cause of idleness, weather conditions; all are members of organization; cash benefits, death, $50 to $300; body incorporated. President, J. W. Perry, General Delivery, Smith's Falls; Corresponding Secretary, Adam Johnson, John Street East (Box 231), Smith's Falls; meets second and fourth Wednesdays in month.

Name,—Brotherhood of Locomotive Engineers, No. 381. Total membership, 58; average earnings per week, $35; average earnings per hour, 39c.; number of working hours first five days, varies; number on Saturday, varies; wages paid monthly; average number of days idle per member during year, 30; general cause of idleness, trade depression; total number (union and non-union) employed at calling, 64; no difference in wages or hours between members and non-members; cash benefits, death, $4,500; superannuation provided by C.P.R.; body incorporated and registered. President, A. G. Boyd, Winnifred Street; Corresponding Secretary, Geo. T. McGloughlin, McGill Street; meets first and third Tuesdays in month.

Name,—International Brotherhood of Maintenance of Way Employes, No. 136. Organized April, 1903; total membership, 75; average earnings per week, foremen, $14.40; labourers, $10.20; average earnings per hour, foremen, 24c.; labourers, 17c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; total number (union and non-union employed at calling in locality, 115; difference in wages of those engaged at calling between members and non-members, 5c.; body incorporated and registered. Pres-

ident, Frank Bragg, Avonmore, Ont.: Corresponding Secretary, A. Seal, Box 64, Finch, Ont.; meets at call of President.

Name,—International Moulders' Union, No. 201. Organized Oct. 1, 1897; total membership, 140; average earnings per week, $17.10; average earnings per hour, 28½c.; number of working hours first five days, 47½; number on Saturday, 9½; wages paid fortnightly; average number of days idle per member during year, 20; general cause of idleness, shut down for repairs; total number (union and non-union) employed at trade in locality, 150; no difference in wages or hours between members and non-members; cash benefits, sickness, $5.40 per week; death, $100 to $200; out of work benefits, dues remitted. President, Wm. Ferguson, Smith's Falls; Corresponding Secretary, Geo. Elliott, Box 263, Smith's Falls; meets first and third Tuesdays in month.

Stevensville.

Name,—Order of Railway Telegraphers (No. 16 Div.) Organized Dec. 22, 1894; total membership, male, 383; female, 4; average earnings per week, male, $15; female, $15; average earnings per hour, male, 15c.; female, 15c.; number of working hours first five days, 60; number on Saturday, 12; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, male, 13; no difference in wages or hours between members and non-members; cash benefits, death, amount of insurance; body incorporated. President, J. C. Culkins, Albion, Mich.; Corresponding Secretary, J. H. Staley, Stevensville, Ontario; meets third Monday in month.

Stratford.

Name,—Journeymen Barbers' International Union, No. 136. Organized 1901; total membership, 20; average earnings per week, $12; average earnings per hour, 17c.; number of working hours first five days, 60; number on Saturday, 15; wages paid weekly; cash benefits, sickness, $5 per week; death, $75 to $500. President, W. T. Nelson; Albert Street; Corresponding Secretary, G. J. Spriggs, 273 Ontario Street; meets last Monday in month.

Name,—Brotherhood of Boiler Makers and Iron Ship Builders of America, No. 297. Organized (International) 1902; National, 1912; total membership, 33; average earnings per week, $12.65; average earnings per hour, 23c.; number of working hours first five days, 50; number on Saturday, 5; wages paid monthly; average number of days idle per member during year, 10; general cause of idleness, legal holidays; total number (union and non-union) employed at trade in locality, 100; no difference in wages or hours between members and non-members; death benefits, $100; no special work for members. President, D. Hishon, 28 Argyle Street; Corresponding Secretary, Wm. Pepper, 78 Inverness Street; meets first and third Fridays in month.

Name,—Bricklayers', Masons' and Plasterers' International Union, No. 24. Organized 1902; total membership, 27; average earnings per week, $24; average earnings per hour, 45c.; number of working hours first five days, 45; number on Saturday, 9; wages paid weekly and fortnightly; average number of days idle per member during year, 150; general cause of idleness, lack of material and bad weather; total number (union and non-union) employed at trade in locality, 50; difference in wages and hours between members and non-members, union men receive 45c. for 9 hours; non-union about $2.50 for 10 hours; death benefit, $50 to

$300. President A. G. Everitt, Chestnut Street; Corresponding Secretary, W. L. Lewis, 107 Milton Street; meets second and fourth Thursdays in month.

Name,—Cigarmakers' Union, No. 424. Organized Aug., 1899; total membership, male, 18; female, 3; average earnings per week, male, $11; female, $11; average earnings per hour, male, 23c.; female, 23c.; number of working hours first five days, 40; number on Saturday, 7½; wages paid weekly; average number of days idle per member during year, varies; general cause of idleness, depression in business; total number (union and non-union) employed at trade in locality, male, 18; female, 3; cash benefits, sickness, $5 per week; death, $50 to $550; out of work benefits, $3 per week; body registered. President, M. E. Whalen, Church Street; Corresponding Secretary, J. Hagarty, 179 St. David Street; meets first Wednesday in month.

Name,—Order of Railway Conductors, Div. No. 15. Organized Jan. 27, 1881; total membership, 29; wages paid monthly; total number (union and non-union) employed at calling in locality, 42; no difference in wages or hours between members and non-members; President, D. McHaffie, 231 Ontario Street; Corresponding Secretary, R. T. Buchanan, 37 Milton Street; meets second and fourth Sundays in month.

Name,—Brotherhood of Locomotive Engineers, No. 188. Organized 1876; total membership, 70; average earnings per week, $20; average earnings per hour, paid by trip; number of working hours first five days, varies; number on Saturday, varies; total number (union and non-union) employed at calling in locality, 70; no difference between members and non-members of organization; cash benefits, death, $1,500 to $4,500; superannuation, $25 per month; special work for members, classes of instruction; body incorporated and registered. President, William A. Brown, 141 Douro Street; Corresponding Secretary, John Battley, 185 Douro Street; meets first and third Sundays in month.

Name,—Amalgamated Society of Engineers, No. 579. Organized 1851; total membership, 29; average earnings per week, $15; average earnings per hour, 55c.; number of working hours first five days, 50; number on Saturday, 5; wages paid monthly; average number of days idle per member during year, regular holidays; no difference in wages and hours between members and non-members; cash benefits, sickness, $2.50 per week; superannuation, $1.75 to $2.50 per week; out of work benefits, $2.50 per week; body registered. President, Hugh Dickie, Burford Street; Corresponding Secretary, William Bell, 216 Douro Street; meets every second Saturday in month.

Name,—Brotherhood of Locomotive Enginemen and Firemen, No. 38. Organized 1873; total membership, 65; average earnings per week, mileage basis; wages paid monthly; general cause of idleness, slack business; total number (union and non-union) employed at calling in locality, 90; no difference in wages or hours between members and non-members; cash benefits, death, $500, $1,000, $1,500, $2,000, $3,000; body incorporated and registered. President, John J. Camp, 145 Rebecca Street; Corresponding Secretary, John F. Spencer, 93 Nile Street; meets second and fourth Sundays in month.

Name,—International Association of Machinists, No. 103. Total membership, 77; average earnings per week, $17; average earnings per hour, 26c.; number of working hours first five days, 50; number on Saturday, 5; wages paid monthly; no idle days; total number (union and non-union) employed at trade in locality, 200; difference in wages or hours between members and non-members, 18c. to 29c. per hour; cash benefits, sickness, G.T.R. has sick benefits; death, according to amount

of insurance; no special work for members. President, Robert Haines, 235 Nelson Street; Corresponding Secretary, E. Etherington, 297 Erie Street; meets second and fourth Mondays in month.

Name,—Brotherhood of Railway Trainmen, No. 8. Organized Sept. 23, 1883; total membership, 90; average earnings per week, $16; average earnings per hour, 25c.; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 150; no difference in wages or hours between members and non-members; death benefits, $1,500. President, T. N. Northcott, Perth Street; Corresponding Secretary, M. T. Fox, 19 Strachan Street; meets first Sunday and third Tuesday in month.

Name,—International Typographical Union, No. 139. Organized Nov. 24, 1900; total membership, 17; average earnings per week, $13.40; average earnings per hour, 27½c.; number of working hours first five days, 40; number on Saturday, 8; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 22; difference in wages and hours of those engaged at trade in locality between members and non-members of organization, $2 a week more and 6 hours less for union men; cash benefits, death, $75 to $450; superannuation, $4 per week. President, H. C. Miller, 75 Downie Street; Corresponding Secretary, Roy H. Dunbar, 195 Brunswick Street; meets first Saturday in month.

Sudbury.

Name,—Bartenders' International League of America, No. 237. Organized Nov. 4, 1906; total membership, 20; average earnings per week, $12; average earnings per hour, 20c.; number of working hours first five days, 50; number on Saturday, 13; no idle days; total number (union and non-union) employed at calling in locality, 30; no difference in wages or hours between members and non-members; cash benefits, sickness, $5 per week; death, $50; body incorporated and registered. President, A. Gatieu, Sudbury; Corresponding Secretary, E. Charron, Sudbury; meets second Monday in month.

Name,—Amalgamated Society of Carpenters and Joiners, No. 9. Organized July, 1911; total membership, 9; average earnings per week, $18; average earnings per hour, 30c.; number of working hours first five days, 50; number on Saturday, 8; wages paid fortnightly; number of days idle per member during year, 30; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 150; cash benefits, sickness, $3 per week; death, $60; superannuation, $2 per week; body registered. President, James Linklater, P.O., General Delivery; Corresponding Secretary, W. Clarke, Box 643; meets alternate Fridays in month.

Name,—Journeymen Tailors' Union of America, No. 226. Organized September, 1906; total membership, male, 10; female, 2; average earnings per week, male, $16; female, $9; average earnings per hour, 25c.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly; total number (union and non-union) employed at trade in locality, male, 12; female, 4; cash benefits, sickness, $5 per week; death, $100; no special work for members. President, J. P. O'Bryne, Box 150; Corresponding Secretary, W. Sangster, Box 150; meets second Monday in month.

THOROLD.

Name,—United Brotherhood of Carpenters and Joiners, No. 1677. Organized June 15, 1887; total membership, 22; average earnings per week, $20; average earnings per hour, 37½c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 30; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 33; difference in wages and hours of labour between members and non-members, union 37½c. and 9 hours per day; non-union 25c. and 10 hours per day; cash benefits, sickness, $3 per week; death, $400; superannuation, $5 per week; body incorporated and registered. President, William McMillen, Thorold; Corresponding Secretary, F. H. Parmeter, Box 224, Thorold; meets third Thursday in month.

TORONTO.

Name,—Journeymen Barbers' International Union, No. 517. Organized Feb. 3, 1909; total membership, 125; average earnings per week, $12; average earnings per hour, 18c.; number of working hours first five days, 55; number on Saturday, 14; wages paid weekly; average number of days idle per member during year, 60 to 90; general cause of idleness, slack business during winter months; total number (union and non-union) employed at trade in locality, male, 600; female, 4; difference in wages and hours of labour of those engaged at trade in locality between members and non-members, members receive about 10 per cent. more wages; cash benefits, sickness, $5 per week; death, $75 to $500. President, George Wright, 1606 Dundas Street; Corresponding Secretary, J. Tennyson, 118 Shuter Street; meets fourth Thursday in month.

Name,—Bartenders' Union and Benefit Society, No. 280. Organized Dec. 20, 1911; total membership, 300; average earnings per week, $14 to $18; average earnings per hour, 15c. to 20c.; number of working hours first five days, 60; number on Saturday, 9; wages paid weekly and a few monthly; total number (union and non-union) employed at calling in locality, 350; difference in wages or hours between members and non-members, union men have shorter hours by 8 to 10 per week; cash benefits, sickness, $4 per week; death, $50; body incorporated and registered. President, A. Cameron, Elliott House, Church Street; Corresponding Secretary, A. O'Leary, 248 Havelock Street; meets fourth Sunday in month.

Name,—International Alliance of Billposters and Billers, No. 40. Total membership, 30; average earnings per week, $14 and $16; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; total number (union and non-union) employed at calling in locality, 30. President, Robt. Harrington; Corresponding Secretary, W. Gimblett, 15 Temperance Street; meets second Sunday in month.

Name,—Brotherhood of Boiler Makers, Iron Ship Builders and Helpers, No. 1. Organized Oct. 29, 1911; total membership, 132; average earnings per week, $16; average earnings per hour, 29c.; average number of days idle per member during year, 7; general cause of idleness, winter weather; number of working hours first five days, 50; number on Saturday, 5; wages paid fortnightly; total number (union and non-union) employed at trade in locality, 240; no difference in wages or hours between members and non-members; cash benefits, sickness, $4 per week; death, $100; out of work benefits, dues remitted. President, James Higgins, 573 Perth

Avenue; Corresponding Secretary, A. E. Potter, 1,201 Dufferin Street; meets second and fourth Fridays in month.

Name,—International Brotherhood of Boiler Makers, Iron Ship Builders and Helpers, No. 548. Organized September, 1910; total membership, 100; average earnings per week, $18; average earnings per hour, C.P.R., 34c.; contract shops, 30c.; number of working hours first five days, C.P.R., 45; contract shops, 50; number on Saturday, 5; wages paid fortnightly and monthly; average number of days idle per member during year, 5; general cause of idleness, holidays; total number (union and non-union) employed at trade in locality, 250; difference in wages or hours between members and non-members, in C.P.R. shops 9 hours per day and 4c. per hour more than contract shops; cash benefits, death, $800; total disability, $800; body registered. President, Chas Young, 169 Mulock Avenue; Corresponding Secretary, W. W. Watson, 37 Jerome Street; meets first and third Fridays in month.

Name,—International Brotherhood of Bookbinders, No. 28. Organized June 27, 1893; total membership, 250; average earnings per week, $18; average earnings per hour, 39c.; number of working hours first five days, 43¾; number on Saturday, 4¼; wages paid weekly; average number of days idle per member during year, 14; general cause of idleness, holidays and slackness; no difference in wages or hours between members and non-members; cash benefits, death, $75. President, Geo. T. Hull, 37 Myrtle Avenue; Corresponding Secretary, C. R. Hurst, 363 Roxton Road; meets second Monday in month.

Name,—Boot and Shoe Workers' International Union, No. 233. Number of working hours first five days, 45; number on Saturday, 4; wages paid weekly; cash benefits, sickness, $5 per week; death, $100. President, John Duncan, 46 Markham Street; Corresponding Secretary, P. M. Waterfield, 66 Bartlett Avenue; meets every Monday in month.

Name,—Brewery Workers International Union, No. 317. Organized Oct. 7, 1902; total membership, 76; average earnings per week, $14.50; average earnings per hour, 25c.; wages paid weekly; total number (union and non-union) employed at calling in locality, 76; difference in wages and hours of labour of those engaged at calling in locality between members and non-members, all are members of organization. President, Jas. Dowling, 33 Sackville Street; Corresponding Secretary, Alf. Cheeseman, 62 Greenwood Avenue, meets second and fourth Thursdays in month.

Name,—Bricklayers', Masons' and Plasterers' Union, No. 2. Organized Nov. 11, 1881; total membership, 1,400; average earnings per week, $17; average earnings per hour, 52½c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 50; general cause of idleness, shortage of material; total number (union and non-union) employed at trade in locality, 1,700; difference in hours of labour of those engaged at trade in locality between members and non-members, 2 hours per day in most instances; cash benefits, death, $250 to $450; club room for members in winter months. President, D. S. McCurdy, 104 Conduit Street; Corresponding Secretary, R. A. Watson, 272 Sackville Street; meets every Tuesday in month.

Name,—Bricklayers', Masons' and Plasterers' International Union of America, No. 26. Organized October, 1904; total membership, 250; average earnings per week, $15; average earnings per hour, 52½c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of

days idle per member during year, 90; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 300; difference in wages and hours of labour of those engaged at trade in locality between members and non-members, 10c. per hour; cash benefits, death, $50 to $300. President, J. E. Booth, 84 McGill Street; Corresponding Secretary, C. Robb, 901 Shaw Street; meets first and third Thursdays in month.

Name,—Bridge and Structural Iron Workers, No. 4. Organized May 14, 1900; total membership, 250; average earnings per week, $12; average earnings per hour, 35c.; number of working hours first five days, 45; number on Saturday, 5; wages paid fortnightly; average number of days idle per member during year, 150; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 600; difference in wages of those engaged at trade in locality between members and non-members, from 17c. to 25c. per hour; cash benefits, death. $100. President, William Joyce, 9 Northcote Avenue; Corresponding Secretary, R. Banks, 218 Logan Avenue; meets first and third Tuesdays in month.

Name,—Broom and Whisk Makers' International Union, No. 55. Organized March 4, 1912; total membership, 21; average earnings per week, $10.50; average earnings per hour, 21½c.; number of working hours first five days, 42½; number on Saturday, 4½; wages paid weekly; number of days idle per member during year, 49; general cause of idleness, lack of material; total number (union and non-union) employed at trade in locality, 40; no difference in wages or hours between members and non-members: body registered. President, William Kirkstead, Deer Park P.O.; Corresponding Secretary, Charles Christopher, 230 Heath Street; meets second and fourth Thursdays in month.

Name,—Builders' Labourers' Union, No. 1. Organized 1881; total membership, 1,200; average earnings per week, $9; average earnings per hour, 28c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 100; general cause of idleness, weather conditions; total number (union and non-union) employed at calling in locality, 2,500; difference in wages of those engaged at calling in locality between members and non-members, 3c. per hour; cash benefits, death, $75; body registered. President, G. Drover, 35 Wyndham Street; Corresponding Secretary, J. Kirby, 19 Belshaw Avenue; meets every Tuesday in month.

Name,—Brotherhood of Railway Carmen, No. 258. Organized April, 1903; total membership, 153; average earnings per week, $11; average earnings per hour, 22c.; number of working hours first five days, 45; number on Saturday, 5; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, varies from 200 to 450; no difference in wages or hours between members and non-members. President, J. E. McEwan, 94 Prescott Avenue; Corresponding Secretary, J. W. Buckley, Mount Dennis P.O.; meets third Wednesdays in month.

Name,—Amalgamated Society of Carpenters and Joiners (First Branch), No. 798. Organized June 4, 1860; total membership, 200; average earnings per week, $17.60; average earnings per hour, 40c.; number of working hours first five days, 40; number on Saturday, 4; wages paid weekly and fortnightly; average number of days idle per member during year, 30; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 2,000; difference in wages and hours of labour of those engaged in locality between members and non-members, union receive from 5c. to 15c. more than non-union; non-

union work 2 hours per day more than union; cash benefits, sickness, $1.25 to $3 per week; death, $60; superannuation, $2; out of work benefits, $1.75 to $2.50 per week; club-room and entertainment provided during winter months; body registered. President, J. E. Walker, 40 Greenwood Avenue; Corresponding Secretary, Arthur Barker, Bertha Street, Swansea; meets every second Monday in month.

Name,—Amalgamated Society of Carpenters and Joiners (Branch 2), No. 873. Organized June 4, 1860; total membership, 134; average earnings per hour, 40c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 15; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 2,500; difference in wages or hours between members and non-members, hours vary from 8 to 10 per day; wages vary from 25c. and upwards; cash benefits, sickness, $2.25 to $3 per week; death, $25 to $60; superannuation, $1.75 or $2; out of work benefits, $1.75 to $2.50 per week; amusement and social work for members; body incorporated and registered. President, C. S. Bottomly, 306 Bathurst Street; Corresponding Secretary, Charles Fraser, 24 Grove Avenue; meets alternate Mondays from January 1, 1912.

Name,—Amalgamated Society of Carpenters and Joiners (Branch 3), No. 874. Organized 1860; total membership, 111; average earnings per week, $13.50; average earnings per hour, 40c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 50; general cause of idleness, weather and holidays; total number (union and non-union) employed at trade in locality, 3,600; body incorporated and registered. President, J. B. Johnson, 191 Emerson Avenue; Corresponding Secretary, George Thomson, 223 Lippincott Street; meets second and fourth Wednesdays in month.

Name,—Amalgamated Society of Carpenters and Joiners (Branch Four), No. 801. Organized June, 1860; total membership, 150; average earnings per week, $16.28; average earnings per hour, 37c.; number of working hours first five days, 40; number on Saturday, 4; wages paid weekly and fortnightly; average number of days idle per member during year, 14; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 2,000; difference in wages and hours of labour of those engaged at trade in locality between members and non-members, some non-union men work longer hours and for smaller pay; cash benefits, sickness, $3 per week, death, $60; superannuation, $2 per week; out of work benefits, $2.50 per week; body registered. President, A. W. Turner, 97 University Avenue; Corresponding Secretary, A. J. Udall, 26 Howie Avenue; meets fortnightly from January first.

Name,—Amalgamated Society of Carpenters and Joiners, No. 802 (Fifth Branch). Organized June 4, 1860; total membership, 32; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 84; general cause of idleness, winter weather; no difference in wages or hours between members and non-members; cash benefits, sickness, $3 per week; death, $100; superannuation, $2 per week; out of work benefits, $2.50 per week. President, H. Tooke, 39 Balmuto Street; Corresponding Secretary, Wm. Burrow, 319 Jones Avenue; meets every second Tuesday in month.

Name,—Amalgamated Society of Carpenters and Joiners, No. 877 (Sixth Branch). Organized 1860; total membership, 121; average earnings per week, $17.60; average earnings per hour, 40c.; number of working hours first five days,

40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 77; general cause of idleness, climatic conditions; total number (union and non-union) employed at trade in locality, 121; difference in wages or hours between members and non-members, non-members work for anything from 20c. per hour up, and all hours; cash benefits, sickness, $3 per week; death, $60; superannuation, $175 to $200; out of work benefits, $1.75 and $2.50 per week; social evenings for members during winter; body registered in Great Britain. President, R. Gidlow, Natilie Street; Corresponding Secretary, T. Gazey, 114 Chester Avenue; meets second and fourth Tuesday in month.

Name,—United Brotherhood of Carpenters and Joiners, No. 27. Organized 1881; total membership, 290; average earnings per week, $17.60; average earnings per hour, 40c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; general cause of idleness, bad weather; total number (union and non-union) employed at trade in locality, 5,000; difference in wages and hours between members and non-members, union men receive 40c. per hour and work 44 hours per week; non-union men receive from 25c. upwards and work 10 hours per day; cash benefits, sickness, $3 per week; death, $200; death of wife, $50; have lectures in winter months for members. President, Charles Moad, 638 Brock Avenue; Corresponding Secretary, Thomas McDonald, 14 Hazelwood Ave.; meets every Tuesday in month.

Name,—United Brotherhood of Carpenters and Joiners of America, No. 1553 (Eglinton, North Toronto). Organized Dec. 11, 1911; total membership, 20; average earnings per week, $16.28; average earnings per hour, 37c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; no difference in wages or hours between members and non-members. President, T. A. Grover, 200 Roehampton Avenue; Corresponding Secretary, H. Gist, 217 Morton Street; meets first and third Fridays in month.

Name,—United Brotherhood of Carpenters and Joiners, No. 1,799. Organized Dec. 20, 1906; total membership, 144; average earnings per week, $17.60; average earnings per hour 40c.; number of working hours first five days, 40; number on Saturdays, 4; wages paid fortnightly; average number of days idle per member during year, 20; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, 3,000; difference in wages or hours between members and non-members, non-union receive 5c. per hour less and work from 1 to 2 hours per day more; death benefits, $200; death of member's wife, $150; special work for members, lessons on steel square and social evenings. President, Gerald Baines, 22 Buchanan Street; Corresponding Secretary, Alex. Suttie, 9 Charles Street East; meets every Thursday in month.

Name,—United Brotherhood of Carpenters and Joiners, No. 1820. Organized May 2, 1911; total membership, 65; average earnings per week, $14.50; average earnings per hour, 30c.; number of working hours first five days, 9 to 10; number on Saturday, 4½ to 5; wages paid weekly and fortnightly; total number (union and non-union) employed at trade in locality, 500; difference in wages and hours of labour of those engaged at trade in locality between members and non-members, union, 27½c. to 35c. per hour; non-union, 20c. to 25c.; most union men work 48 hours per week; non-union, 55; cash benefits, death, $200; disability benefit, $100; body incorporated and registered. President, Arch. Marmichael, 67 Tiverton Ave.; Corresponding Secretary, T. Jackson, 67 Tiverton Avenue; meets every Tuesday in month.

Name,—International Carriage and Waggon and Automobile Workers, No.

85. Total membership, 200; average earnings per week, $12; average earnings per hour, 22½c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 60; general cause of idleness, condition of trade; total number (union and non-union) employed at trade in locality, 400; difference in wages or hours between members and non-members, 1 hour per day; death benefit, $50 to $100. President, John McDoland, 59 River Street; Corresponding Secretary, H. Gain, 344 Clinton St.; meets first and third Wednesdays in month.

Name,—Cigarmakers' International Union, No. 27. Organized May, 1869; total membership, male, 435; female, 40; average earnings per week, male, $12; female, $12; average earnings per hour, male, 28c.; female, 28c.; number of working hours first five days, 40; number on Saturday, 4; wages paid weekly; average number of days idle per member during year, 21; general cause of idleness, stock taking and damp weather; total number (union and non-union) employed at trade in locality, male, 435; female, 40; all are members of organization; cash benefits, sickness, $5 per week; death, $50 to $550; out of work benefits, $3 per week; body incorporated and registered. President, J. McCarthy, 118 Manning Avenue; Corresponding Secretary, J. Pamphilon, Room 106, 88 Church Street; meets third Monday in month.

Name,—Order of Railway Conductors, No. 17. Total membership, 71; wages paid monthly; general cause of idleness, depression in trade; no difference in wages or hours between members and non-members; death benefits, amount of insurance; body incorporated and registered. President, Charles Stewart, Rose Hill Avenue; Corresponding Secretary, A. Riley, 706 Markham Street; meets first and third Sundays in month.

Name,—Order of Railway Conductors, No. 345. Organized, 1893; total membership, 60; wages paid monthly; general cause of idleness, depression in trade; no difference in wages or hours between members and non-members; cash benefits, $1,000, $2,000, $3,000; body incorporated and registered. President, A. B. Garretson, Cedar Rapids, Iowa; Corresponding Secretary, G. A. Wood, 61 Empress Crescent; meets second and fourth Sunday in month.

Name,—International Brotherhood of Electrical Workers, No. 114. Organized, 1805; total membership, 97; average earnings per week, $17.60; average earnings per hour, 40c.; number of working hours first five days, 40; number on Saturday, 4; wages paid weekly and fortnightly; average number of days idle per member during year, 30; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 300; difference in wages between members and non-members, union 40c. per hour; non-union, 30c. to 40c. per hour; cash benefits, death, $100. President, H. G. Allen, 122 Paton Road; Corresponding Secretary, J. D. Hagerman, 952 Shaw Street; meets second and fourth Thursdays in month.

Name,—International Brotherhood of Electrical Workers (Linemen), No. 353. Organized November, 1905; total membership, 250; average earnings per week, $15 to $18; average earnings per hour, 33 1-3c.; number of working hours first five days, 45; number on Saturday, 9; every other Saturday, 5; wages paid weekly; average number of days idle per member during year, 25 to 30; general cause of idleness, inclement weather; total number (union and non-union) employed at calling in locality, 300; difference in wages or hours between members and non-members, Hydro, signed job, 9 hours per day; Bell and Toronto Electric Light Co., 10 hours per day; scale wages, Hydro, 33 1-3c., 30½c., 27 1-3c., 1st, 2nd and 3rd class; other companies anywhere from 22c. to 30c. per hour; cash

benefits, sickness, $4 per week; death, $100; body incorporated and registered. President, A. Irwin, 38 Endean Avenue; Corresponding Secretary, W. F. Robinson, 130 Bolton Avenue; meets first and third Wednesdays in month.

Name.—Amalgamated Society of Engineers, No. 689. Organized 1857; total membership, 170; average earnings per week, $15; average earnings per hour, 25c. to 30c.; number of working hours first five days, 50; number on Saturday, 5; wages paid weekly, fortnightly and monthly; no difference in wages or hours between members and non-members; cash benefits, sickness, $2.50 per week; death, $60; superannuation, $1.50 to $2.50 per week; out of work benefits, $2.50 per week; body registered. President, W. E. Horton, 39 Mutual Street; Corresponding Secretary, John M. Clements, 650 Shaw Street; meets alternate Mondays in month.

Name,—International Union Steam Engineers (Hoisting and Portable), No. 356. Organized Jan. 15, 1896; total membership, 50: average earnings per week, $24; average earnings per hour, 40c.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly; average number of days idle per member during year, 30; general cause of idleness, inclement weather; total number (union and non-union) employed at trade in locality, 150; difference in wages or hours between members and non-members, non-union receive from 5c. to 10c. per hour less than union. President, Richard Banks, 215 Logan Avenue; Corresponding Secretary, L. Putman, 122 Augusta Avenue; meets first and third Wednesdays in month.

Name,—Brotherhood of Locomotive Engineers, No. 70. Organized 1868; total membership, 73; average earnings per week, depends on number of hours worked; average earnings per hour, 42c.; number of working hours first five days, varies; number on Saturday, varies; wages paid monthly; average number of days idle per member during year, depends on trade; general cause of idleness, slackness in trade or freight traffic; no difference in wages or hours between members and non-members; cash benefits, death, graded policies; body incorporated and registered. President W. Newcombe, 490 Markham Street: Corresponding Secretary, I. Belyea, 1002 Bathurst Street; meets second and fourth Sundays in month.

Name,—Brotherhood of Locomotive Engineers, No. 295. Organized, 1865; total membership, 140; average earnings per week, $25; average earnings per hour, 35c.; number of working hours first five days, irregular; number on Saturday, irregular: wages paid monthly; no idle days: total number (union and non-union) employed at calling in locality, 250; no difference in wages or hours between members and non-members: cash benefits, death, $1,500 to $4,500; body incorporated and registered. President, A. W. Scruton, 64 McKenzie Crescent; Corresponding Secretary, W. B. Carruthers, 73 Laws Street, West Toronto: meets first Sunday and third Monday in month.

Name,—Steam Engineers' International Union, No. 152. Organized Dec. 7, 1898; total membership, 350; average earnings per week, $14; average earnings per hour, 25c.: number of working hours first five days, 50; number on Saturday, 5; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 1,000; no difference between members and non-members in wages; in plants running 24 hours, union men work 8 hours, and non-union 12; cash benefits, sickness, $3 per week; death, $100; reading and recreation room in Labour Temple; lectures on technical subjects at every meeting. President, Chas. Powers, 437 Pape Avenue; Corresponding Secretary, Robert Shepherd, 210 Berkeley Street; meets second and fourth Wednesdays in month.

Name,—Brotherhood of Locomotive Firemen and Enginemen, No. 67. Organ-

ized March, 1877; total membership, 50; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 100; no difference in wages or hours between members and non-members: cash benefits, sickness, $3 per week; death, amount of insurance; no special work for members. President, Geo. E. Crowhurst, 90 Wolseley Street; Corresponding Secretary, James Pratt, 218 Fern Avenue; meets first Thursday and third Sunday in month.

Name,—Brotherhood of Locomotive Enginemen and Firemen, No. 262. Organized Dec. 1, 1873; total membership, 275; average earnings per week, $30; number of working hours first five days, irregular; number on Saturday, irregular; wages paid monthly; average number of days idle per member during year, irregular; general cause of idleness, depression in trade; total number (union and non-union) employed at calling in locality, 278; no difference in wages or hours between members and non-members; cash benefits, death, $500, $1,000, $1,500, $2,000, $3,000; body incorporated and registered. President, Geo. H. Smyth, 1031 Keele Street, West Toronto; Corresponding Secretary, W. H. Blevins, 74 Fairview Ave., West Toronto; meets second and fourth Sundays and first Tuesdays in month.

Name,—International Brotherhood of Stationary Firemen, No. 300. Organized, October, 1911; total membership, 80. President, A. A. Woodward, 741 Markham Street; Corresponding Secretary, George T. McCann, 35 Marlborough Ave.; meets second and fourth Thursdays in month.

Name,—Fur Cutters' and Workers' Union, No. 14,202. Organized Feb. 7, 1912; total membership, 75; average earnings per week, $16; average earnings per hour, 32¾c.; number of working hours first five days, 45; number on Saturday, 4; wages paid weekly; general cause of idleness, slack season; total number (union and non-union) employed at trade in locality, male, 200; female, 300. President L. Benson, 697 Pape Avenue; Corresponding Secretary, Alfred Mullaby, 561 Logan Ave.; meets first and third Wednesday in month.

Name,—Fur Workers' Union, No. 14,187. Organized Dec. 13, 1911; total membership, male, 70; female, 2; average earnings per week, male, $8 to $25; female, $6 to $12; average earnings per hour, male, 17c. to 50c.; female, 13c. to 22c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 28; general cause of idleness, depression in trade; total number (union and non-union) employed at trade in locality, male, 120; female, 30; no difference in wages or hours between members and non-members; body incorporated and registered. President, J. Weinzweig, 59 Huron Street; Corresponding Secretary, Philip Lipson, 112 Parliament Street; meets second and fourth Wednesdays in month.

Name,—Garment Cutters' Union (Ladies), No. 83. Organized Jan. 6, 1912; total membership, 90; average earnings per week, $14; average earnings per hour, 28c.; number of working hours first five days, 45; number on Saturday, 4; wages paid weekly; average number of days idle per member during year, 35; general cause of idleness, slackness in trade; total number (union and non-union) employed at trade in locality, 200. President, H. Richardson, 278 Berkeley Street; Corresponding Secretary, J. H. Collier, 171 Elizabeth Street; meets every Monday in month.

Name,—United Garment Workers (Cutters and Trimmers), No. 185. Organized June, 1902; total membership, 95; average earnings per week, $16; average earnings per hour, 32c.; number of working hours first five days, 45; number on Saturday, 4; wages paid weekly; average number of days idle per member during year, 15; general cause of idleness, depression in trade; total number (union and

non-union) employed at trade in locality, 250; difference in wages or hours between members and non-members, non-union men average $2 per week less and work 52 hours per week; cash benefits, sickness, $4 per week; instruction given on special order cutting to members. President, Fred Bush, 1115 College Street; Corresponding Secretary, H. A. Keller, 59 Grange Avenue; meets second and fourth Fridays in month.

Name.—United Garment Workers of America, No. 202. Organized 1907; total membership, female, 75; average earnings per week, female, $8; average earnings per hour, female, 16¾c.; number of working hours first five days, 45; number on Saturday, 4; wages paid weekly; average number of days idle per member during year, 60; general cause of idleness, slack seasons; no difference in wages or hours between members and non-members; body registered. President, Annie Oster, 167 St. Helen's Avenue; Corresponding Secretary, Miss F. Woods, 110 Bellevue Avenue; meets second Mondays in month.

Name,—Gas Workers' Federal Union, No. 1. Organized Aug. 1, 1911; total membership, 250; average earnings per week, $15; average earnings per hour, 31c.; number of working hours first five days, 40; number on Saturday, 8; wages paid weekly; body registered. President, Joseph McDermott, 722 Gerrard Street; Corresponding Secretary, M. F. MacKenzie, 37 Howland Road, Rosedale, Toronto; meets Monday (once a month during summer, twice during winter).

Name.—Glass Bottle Blowers' International Association, No. 66. Total membership, 110; average earnings per week, $30; average earnings per hour, 55c.; number of working hours first five days, 44; number on Saturday, 8; wages paid fortnightly; average number of days idle per member during year, 90; general cause of idleness, foreign competition; total number (union and non-union) employed at trade in locality, 110; no difference in wages or hours between members and non-members; cash benefits, death, $500. President, B. C. Johnson, 38 Beaconsfield Avenue; Corresponding Secretary, Howard Munn, 164 Argyle Street; meets first Saturday in month.

Name.—Amalgamated Glass Workers' International Association, No. 21. Organized January, 1902; total membership, 65; average earnings per week, $15; average earnings per hour, 30c.; number of working hours first five days, 45; number on Saturday, 5; average number of days idle per member during year, 24; general cause of idleness, slackness in trade; total number (union and non-union) employed at trade in locality, 150; no difference in wages or hours between members and non-members; cash benefits, death, $75; total disability, $100. President J. J. McKenna, 169 Wolfrey Avenue; Corresponding Secretary, J. Warburton, 22 Wascana Avenue; meets first and third Fridays in month.

Name.—Granite Cutters' International Association (Toronto Branch). Reorganized November 20, 1905; total membership, 40; minimum earnings per week, $16.50; minimum earnings per hour, 37½c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 70; cash benefits, death, $200. President, William Nettleship, 44 Baker Avenue; Corresponding Secretary, Peter Stuart, 197 Marlboro' Avenue; meets fourth Wednesday in month.

Name.—United Brotherhood of Leather Workers on Horse Goods, No. 93. Organized April 14, 1902; total membership, 4; average earnings per week, $10; average earnings per hour, 18c.; number of working hours first five days, 50; number on Saturday, 5; wages paid fortnightly; total number (union and non-

union) employed at trade in locality, male, 300; female, 25; no difference in wages or hours between members and non-members; cash benefits, sickness, $5 per week; out of work benefits, dues remitted; body incorporated and registered. President, H. O. Smith, 30 Price Street; Corresponding Secretary, C. Coulter, 518 Lansdowne Avenue; meets first Friday in month.

Name,—Lithographers' International Association, No. 12. Organized 1900; total membership, 135; average earnings per week, $18; average earnings per hour, 37½c.; number of working hours first five days, 43¾; number on Saturday, 4¼; wages paid weekly; average number of days idle per member during year, 12; general cause of idleness, slackness in trade; total number (union and non-union) employed at trade in locality, 175; no difference between members and non-members; cash benefits, sickness, $3 to $5 per week; death, $100 to $500; body incorporated. President, Alex. Tennie, 391 Carlton Street; Corresponding Secretary, James H. Christie, 104 Palmerston Avenue; meets second and fourth Wednesday in month.

Name,—Longshoremen's International Association, No. 646. Organized Sept. 20, 1904; total membership, 30; wages paid weekly; average number of days idle per member during year, 180; general cause of idleness, weather conditions; total number (union and non-union), employed at calling in locality, 42; no difference between members and non-members. President, J. Dowling, 33 Sackville Street; Corresponding Secretary, S. Stalford, 2 Curzon Street; meets first Sunday in month.

Name,—International Association of Machinists, No. 235. Organized Feb. 13, 1892; total membership, 475; average earnings per week, $14 to $18; average earnings per hour, 25c. to 35c.; number of working hours first five days, 45 to 50; number on Saturday, 5; wages paid weekly and fortnightly; average number of days idle per member during year, uncertain; general cause of idleness, slackness in trade; total number (union and non-union) employed at trade in locality, 1,500; difference in hours of labour between members and non-members, union 9 hours; non-union, 10 hours; cash benefits, sickness, $5 per week; death, $50 to $200; out of work benefits, dues remitted; special work for members, classes for discussion of economics and mechanics. President, W. C. Hagen, 844 Queen Street East; Corresponding Secretary, Geo. Crossman, 273 Arthur Street; meets second and fourth Wednesdays in month.

Name,—Mailers' Union (I.T.U.), No. 5. Organized, 1893; total membership, 48; average earnings per week, $18; average earnings per hour, 40c.; number of working hours first five days, 35; number on Saturday, 7; wages paid weekly; no idle days; total number (union and non-union) employed at calling in locality, male, 60; female, 10; difference in wages and hours of labour of those engaged at calling in locality, non-union, from $4 to $15 per week; no stated hours; cash benefits, death, $75 to $400; superannuation, $4 per week; body incorporated and registered. President, J. J. Gallagher, 50 Beaconsfield Avenue; Corresponding Secretary, E. A. Spanner, 867 King Street West; meets second Sunday in month.

Name,—Moulders' International Union, No. 28. Organized April 21, 1860; total membership, 475; average earnings per week, $17; average earnings per hour, 34c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly and fortnightly; average number of days idle per member during year, 21; general cause of idleness, depression in trade; total number (union and non-union) employed at trade in locality, 750; difference in wages and hours of labour of those engaged at trade in locality between members and non-

members, non-union work 10 hours for the same pay as union get for 9; cash benefits, sickness, $5.40 per week; death, $130 to $230; out of work benefits, dues remitted. President, Robert Harper, 92 O'Hara Avenue; Corresponding Secretary, Robert Harris, 110 Ossington Avenue; meets first and third Wednesdays in month.

Name,—Brass Moulders' International Union, No. 207. Organized Jan. 5, 1910; total membership, 48; average earnings per week, $17.75; average earnings per hour, 34c.; number of working hours first five days, 50; number on Saturday, 5; wages paid weekly and fortnightly; no idle days; total number (union and non-union) employed at trade in locality, 65; difference in wages between members and non-members, non-union receive $1.75 to $2.50 per day; union, $3 to $4 per day; cash benefits, sickness, $5.40 per week; death, $50 to $200; out of work benefits, dues remitted; body incorporated and registered. President, A. V. Mann, 44 Geneva Avenue; Corresponding Secretary, W. G. Jones, 19 Tiverton Avenue; meets first and third Fridays in month.

Name,—Moving Picture Machine Operators (I.A.T.S.E.), No. 173. Organized Nov. 17, 1909; total membership, 53; average earnings per week, $16; average earnings per hour, 50c.; number of working hours first five days, 35; number on Saturday, 8; wages paid weekly; no idle days; total number (union and non-union) employed at calling in locality, 60; difference in wages or hours between members and non-members, non-union receive $12 per week and longer hours than union men; body incorporated and registered. President, F. Rynas, 984 Bathurst Street; Corresponding Secretary, R. Mitchell, 184 Grange Avenue; meets first and third Sundays in month.

Name,—International Musical Protective Association, No. 149. Organized Dec. 2, 1887; total membership, male, 630; female, 30; wages paid weekly; difference in wages or hours between members and non-members, non-union work longer hours and receive less pay; cash benefits, sickness, $3 per week; death, $50; superannuation, old age fund; room open for members; body incorporated and registered. President, J. E. Jarrott, 1,405 King Street West; Corresponding Secretary, J. Ball, Musicians' Temple, University Avenue; meets first Sundays in month.

Name,—Brotherhood of Painters, Decorators and Paperhangers of America, No. 3. Total membership, 445; average earnings per week, $15.40; average earnings per hour, 35c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 30; general cause of idleness, lack of work; total number (union and non-union) employed at trade in locality, 400; difference in wages or hours between members and non-members, non-union work for 30c. or less per hour and work longer hours; death benefits, $50 to $300; reading and day room for members. President, G. E. Phillips, 30 Prospect St.; Corresponding Secretary, John W. Williams, 2 Prospect Street; meets second and fourth Tuesdays in month.

Name,—Brotherhood of Painters, Decorators and Paperhangers of America, No. 737. Organized April, 1907; total membership, 85; average earnings per week, $15.40; average earnings per hour, 35c.; number of working hours first five days, 40; number on Saturday, 4; wages paid weekly and fortnightly; average number of days idle per member during year, 60; general cause of idleness, weather conditions; difference in wages or hours between members and non-members, non-union receive 5c. per hour less than union; death benefits, $300.

President, Jas. Butler, 227 Bolton Avenue; Corresponding Secretary, Thos. Riley, 219 Sherbourne Street; meets second and fourth Wednesdays in month.

Name,—Patternmakers' League of North America. Organized 1898; total membership, 125; average earnings per week: $21; average earnings per hour, 37½c. to 45c.; number of working hours first five days, 45 and 50; number of Saturday, 4½ and 5; wages paid weekly and fortnightly; average number of days idle per member during year, 30; general cause of idleness, slackness of trade; total number (union and non-union) employed at trade in locality, 150; difference in wages and hours of labour of those engaged at trade in locality between members and non-members, from 25c. to $1; cash benefits, sickness, $4 per week; death, $50 to $400; classes for apprentices. President, Fred Bancroft, 18 Sinclair Avenue; Corresponding Secretary, Jas. Graham, 270 Delaware Avenue; meets second and fourth Mondays in month.

Name,—Photo-Engravers' International Union, No. 35. Total membership, 70; average earnings per week, $20; average earnings per hour, 43c.; number of working hours first five days, 42½; number on Saturday, 4; wages paid weekly; no idle days; total number (union and non-union) employed at trade in locality, 100; no difference between members and non-members; cash benefits, death, $100. President, A. Rothwell, 16 Major Street; Corresponding Secretary, F. Hodgetts, 106a McCaul Street; meets first Mondays in month.

Name,—Operative Plasterers' International Association, No. 48. Organized 1869; total membership, 300; average earnings per week, $22; average earnings per hour, 50c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 24 to 72; general cause of idleness, cold weather and depression in trade; total number (union and non-union) employed at trade in locality, 500; difference in wages or hours between members and non-members, non-union receive 5c. per hour less than union; death benefit, $300. President, D. A. Webber, 709 Manning Avenue; Corresponding Secretary, W. J. Hamilton, 307 Salem Avenue; meets second and fourth Thursdays in month.

Name,—United Association of Plumbers, Gas Fitters and Steam Fitters, etc., No. 46. Total membership, 300; number of working hours first five days, 40; number on Saturday, 4; wages paid weekly and fortnightly; total number (union and non-union) employed at trade in locality, 500; difference in wages or hours between members and non-members, union 40c. per hour; non-union, from 25c. upwards; cash benefits, sickness, $5 per week; death, $100; superannuation, from $300 to $500 cash payment; lectures for members during fall and winter months. President, D. Bullock, 256 Kingston Road; Corresponding Secretary, D. Rattery, 766 Dovercourt Road; meets second and fourth Fridays in month.

Name,—International Union of Metal Polishers, Buffers, Platers, and Brass Workers, No. 21. Number of working hours first five days, 47½; number on Saturday, 5; wages paid weekly and fortnightly; average number of days idle per member during year, 20; general cause of idleness, sickness; total number (union and non-union) employed at trade in locality, 250; difference in wages or hours between members and non-members, union men receive about $2 per week more than non-union men; cash benefits, sickness, $3 to $5 per week; death, $300; out of work benefits, dues remitted. President, Alfred J. Atkinson, 349 Grace Street; Corresponding Secretary, Walter Driscoll, 24 Sword Street; meets second and fourth Wednesdays in month.

Name,—Webb Pressmen's Union, No. 1. Organized August, 1893; total membership, 59; average earnings per week, $18; average earnings per hour, 37½c.; number of working hours first five days, 40; number on Saturday, 8; wages paid weekly; no idle days; total number (union and non-union) employed at calling in locality, 59; all are members of organization; body incorporated and registered. President, George Edmondson, 11 Wright Avenue; Corresponding Secretary, W. Hall, 113½ Lansdowne Avenue; meets third Monday in month.

Name,—Amalgamated Sheet Metal Workers' International Alliance, No. 30. Total membership, 180; average earnings per week, $16.50; average earnings per hour, 35c.; number of working hours first five days, 40 and 45, according to shops and time of year; number on Saturday, 4 and 5; wages paid weekly; average number of days idle per member during year, very few; general cause of idleness, depression in trade; total number (union and non-union) employed at trade in locality, 300; difference in wages or hours between members and non-members, non-union men work 10 hours and receive from 20c. to 30c. per hour; death benefit, $100; drawing school for members in winter months. President, D. McCarthy, 406 Spadina Avenue; Corresponding Secretary, A. J. Murray, 40 Hastings Avenue; meets first and third Fridays in month.

Name,—International Union of Slate and Tile Roofers, No. 39. Organized January, 1910; total membership, 30; average earnings per week, $14; average earnings per hour, 40c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; general cause of idleness, wet and cold weather; total number (union and non-union) employed at trade in locality, 50; death benefit, $100; body incorporated and registered. President, E. T. Smith, 91 Withrow Avenue; Corresponding Secretary, James Patrick, 942 Queen Street East; meets first and third Mondays in month.

Name,—International Association of Steam Fitters, No. 78. Organized November, 1909; total membership, 155; average earnings per week, $17; average earnings per hour, 42½c; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 60; general cause of idleness, slackness in building trade; total number (union and non-union) employed at trade in locality, 200; difference in wages or hours between members and non-members, non-union receive 15c. less per hour than union men; death benefit, $150; special work for members, lectures, etc. President, E. Lawson, 110 Geoffrey Street; Corresponding Secretary, Wm. Mackenzie, 139 Lisgar Street; meets second and fourth Fridays in month.

Name,—International Union of Stereotypers and Electrotypers, No. 21. Organized March 15, 1893; total membership, 74; average earnings per week, $19; number of working hours first five days, 43; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 3; general cause of idleness, lack of work; total number (union and non-union) employed at trade in locality, 74; death benefits, $100. President, Henry Perkins, 293 Wilton Avenue; Corresponding Secretary, Edgar Young, 442 West Marian Street; meets first Thursdays in month.

Name,—Journeymen Stonecutters' Association of North America. Organized Dec. 5, 1853; total membership, 175; average earnings per week, $12; average earnings per hour, 50c. (after May 1, 1912, 52½c.); number of working hours first five days, 44; number on Saturday, 4; wages paid fortnightly; average number of days idle per member during year, 120 to 150; general cause of idleness, slackness of trade and bad weather; difference in wages and hours of labour of those

engaged at trade in locality between members and non-members, non-union, 35c. to 50c.; union, 50c.; cash benefits, death, $100. President, David Crockatt, 10 Wood Street; Corresponding Secretary, Harry Newson, 32 Hazlewood Avenue; meets second and fourth Fridays in month.

Name,—Amalgamated Association of Street and Electric Railway Employees of America, No. 113. Organized Aug. 23, 1893; total membership, 1,410; average earnings per week, $13.75; average earnings per hour, 23½c.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly; no idle days; total number (union and non-union) employed at calling in locality, 1,500; no difference in wages or hours between members and non-members; cash benefits, sickness, $3 per week and free doctor and medicine; death, $100; superannuation, $800 at 65 years of age if 20 years in the Association; body incorporated and registered. President, H. C. Johnston, 78 Grant Street; Corresponding Secretary, Jos. Gibbons, 167 Church Street; meets first Monday, 8 p.m., third Sunday, 2 p.m., each month.

Name,—Journeymen Tailors' Union of America, No. 132. Organized 1890; total membership, male, 350; female, 50; average earnings per week, male, $13; female, $9; average earnings per hour, male, 25c.; female, 18c.; number of working hours first five days, 50; number on Saturday, 10; wages paid weekly; average number of days idle per member during year, 50; general cause of idleness, slackness in trade; total number (union and non-union) employed at trade in locality, male, 600; female, 150, including helpers; difference in wages or hours between members and non-members, little difference, piece work; cash benefits, sickness, $5 per week; death, $100; special work for members, lectures on social and economic subjects; also talks on trade and fashion. President, E. H. Glenn, 7 Alexander Street; Corresponding Secretary, James Watt, Labour Temple; meets second and fourth Mondays in month.

Name,—Journeymen Tailors' International Union of America, No. 156. Organized 1883; total membership, male, 15; female, 9; average earnings per week, male, $13; female, $9; average earnings per hour, male, 22c.; female, 22c.; hours of labour, piece work; wages paid fortnightly; average number of days idle per member during year, 48; general cause of idleness, dullness of trade; all are members of organization; cash benefits, sickness, $5 per week; death, $100; body incorporated and registered. President, T. Curtis, c-o Agnew, Merchant Tailor, West Toronto; Corresponding Secretary, W. W. Greenwood, 213 Symington Avenue, West Toronto; meets second Monday in month.

Name,—Team Owners' Association. Total membership, 400. President, Joseph Caldwell, 33 Hamilton Street; Corresponding Secretary, J. Gosnell, 102 Sherbourne Street; meets first and third Thursdays in month.

Name,—International Brotherhood of Teamsters, (Coal Drivers) No. 457. Organized October, 1904; total membership, 60; average earnings per week, $12; average earnings per hour, 22c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; no idle days; total number (union and non-union) employed at calling in locality, 450; difference in wages between members and non-members, $1 to $2; strike benefits, $5 per week. President, Walter Osborne, 811 Bathurst Street; Corresponding Secretary, W. R. Barton, 36 Sully Crescent; meets first and third Sundays in month.

Name,—International Brotherhood of Teamsters (Milk Waggon Drivers and Dairy Helpers), No. 458. Organized Dec. 11, 1911; total membership, 60; average earnings per week, $13; average earnings per hour, 20c.; number of

working hours first five days, 45; number on Saturday, 10 or 12; Sundays 8; wages paid weekly and fortnightly; no idle days; total number (union and non-union) employed at calling in locality, 500; no difference in wages or hours between members and non-members; no special work for members. President, A. E. Ide, 101 Degrassi Street; meets first and third Wednesdays in month.

Name,—Commercial Telegraphers' Union, Div. No. 6 (C. P. R.). Organized May, 1909; total membership, male, 80; female, 25; number of working hours, 9 per day; 7 and 7½ per night, Saturday included: wages paid monthly: total number (union and non-union) employed at calling in locality, male, 150; female, 50; no difference in wages or hours between members and non-members; no cash benefits, but insurance department separate. President, M. Mackay, 79 Hutchison Street, Montreal; Corresponding Secretary, C. E. Hill, 362 Brock Avenue, Toronto; meets once a month.

Name,—International Union of Tilesetters, No. 37. Organized 1902; total membership, 85; average earnings per week, $19; average earnings per hour, 45c.; number of working hours first five days, 40; number on Saturday, 4; wages paid fortnightly; general cause of idleness, no work; total number (union and non-union) employed at trade in locality, 85; no difference in wages or hours between members and non-members. President, James Cowan, 42 Hallam Street; Corresponding Secretary, Howard Crockford, 36 Wheeler Avenue; meets first and third Fridays in month.

Name,—Brotherhood of Railway Trainmen, No. 255. Organized March 30, 1888; total membership, 390; average earnings per week, $20 to $35; average earnings per hour, 24c. to 36c.; number of working hours vary; wages paid monthly; average number of days idle per member during year, vary; general cause of idleness, depression in trade; total number (union and non-union) employed at calling in locality, 500; no difference in wages or hours between members and non-members; cash benefits, death, $500 to $1,500. President, T. L. H. McGuire, 115 Fermanagh Avenue; Corresponding Secretary, J. H. Davison, 168 St. John's Road; meets first and third Sundays; every Monday except first and third.

Name,—Brotherhood of Railway Trainmen, Queen City Lodge, No. 322. Organized Jan. 23, 1889; total membership, 178; average earnings per week, $20; average earnings per hour, 25c. to 35c.; number of working hours, uncertain; wages paid monthly; average number of days idle per member during year, uncertain; general cause of idleness, lack of freight; total number (union and non-union) employed at calling in locality, 225; no difference in wages or hours between members and non-members; cash benefits, death, $500, $1,000, $1,350. President, L. S. Ward, 234 Pearson Avenue; Corresponding Secretary, H. T. Meredith, 282 Crawford Street; meets first and third Sundays in month.

Name,—International Union of Travellers' Goods and Leather Novelty Workers, No. 5. Organized February, 1902; total membership, 37; average earnings per week, $13; average earnings per hour, 25c.; number of working hours first five days, 47½; number on Saturday, 5; wages paid fortnightly; average number of days idle per member during year, 15; general cause of idleness, stock taking; total number (union and non-union) employed at calling in locality, 43; difference in wages or hours between members and non-members, about 4c. per hour or $2 per week; death benefit, $100; body incorporated and registered. President, R. J. Hodge, 630 Ossington Avenue; Corresponding Secretary, W. G. Duncan, 195 Osler Avenue; meets second Wednesdays in month.

Name,—International Typographical Union, No. 91. Organized Sept. 13, 1844; total membership, male, 1,100; female, 2; average earnings per week, male, $18; female, $17; average earnings per hour, male, 38c.; female, 35c.; number of working hours first five days 44; number on Saturday, 4; wages paid weekly; total number (union and non-union) employed at trade in locality, male, 1,140; female, 10; difference in wages and hours of labour between members and non-members, union men work 8 hours, non-union men 10 hours; non-union work for what they can get; cash benefits, sickness, $4 per week; death, $450; superannuation, $5 per week; body incorporated and registered. President, A. E. Thompson, 624 Ontario Street; Corresponding Secretary, Samuel Hadden, Room 21, 77 Victoria Street; meets first Saturday in month.

Name,—Upholsterers' International Union of North America, No. 30. Total membership, 80; average earnings per week, $15; average earnings per hour, 33c.; number of working hours first five days, 45; number on Saturday, 4; wages paid weekly and fortnightly; average number of days idle per member during year, 14; general cause of idleness, slack season; total number (union and non-union) employed at trade in locality, 100; difference in wages between members and non-members, 6c. to 8c. per hour; cash benefits, sickness, $4 per week for four consecutive weeks; body incorporated and registered. President, R. Williams, 1 Newsham Street; Corresponding Secretary, F. Moore, 34 McGill Street; meets first and third Fridays in month.

Name,—Waiters Union, No. 300. Organized March, 1911; total membership, 100; average earnings per week, $6; average earnings per hour, 9c.; number of working hours first five days, 60; number on Saturday, 10; wages paid weekly, fortnightly and monthly; average number of days idle per member during year, 90; general cause of idleness, slackness in trade; total number (union and non-union) employed at calling in locality, male, 300; female, 200; no difference in wages or hours between members and non-members; cash benefits, death, $50; special work for members. President, V. Davey, 400 Sackville Street; Corresponding Secretary, F. H. Benmore, 20 West Street; meets every second and fourth Wednesday at 8.30 p.m.

Webbwood.

Name,—International Brotherhood of Maintenance of Way Employees, No. 70. Total membership, 30; average earnings per week, $15; average earnings per hour, 25c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; total number (union and non-union) employed at calling in locality, 45; body registered. President, W. S. Smith, Walford Station; Corresponding Secretary, W. McCarthy, Webbwood; meets third Saturday in month.

Welland.

Name,—Amalgamated Society of Carpenters and Joiners, No. 809. Organized June 4, 1907; total membership, 19; average earnings per week, $19.20; average earnings per hour, 35c.; number of working hours first five days, 45; number on Saturday, 9; wages paid weekly; average number of days idle per member during year, 50; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 150; difference in wages and hours of labour of those engaged at trade in locality between members and non-members, non-union receive 25c. to 30c. per hour, and work 10 hours per day; cash benefits, sickness, $3 per week; death, $75; out of work benefits, $2.50 per week. President, George Urquhart, Garner Avenue; Corresponding Secretary, William Powrie, River Road; second and fourth Mondays in month.

Name,—United Brotherhood of Carpenters and Joiners, No. 969. Organized January, 1902; total membership, 16; average earnings per week, $16.20; average earnings per hour, 30c.; number of working hours first five days, 45; number on Saturdays, 9; wages paid weekly; average number of days idle per member during year, 60; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 80; difference in hours of labour between members and non-members, non-union work 10 hours per day; cash benefits, death, $200. President, E. Miller, Welland P.O.; Corresponding Secretary, Byron Jackson, Box 897, Welland; meets second and fourth Fridays in month.

Name,—International Association of Machinists, No. 131. Organized February, 1911; total membership, 26; average earnings per week, $15; average earnings per hour, 27½c. to 30c.; number of working hours first five days, 50; number on Saturday, 10; wages paid fortnightly; total number (union and non-union) employed at trade in locality, 75; cash benefits, death, $50 to $200; out of work benefits, dues remitted. President, N. F. Verellen, Asher Street; Corresponding Secretary, W. S. Noble, Box 307, Welland; meets first and third Mondays in month.

Name,—International Moulders' Union, No. 472. Organized Nov. 1, 1907; total membership, 50 to 60; average earnings per week, $18 to $20; average earnings per hour, 30c. to 32½c.; number of working hours first five days, 50; number on Saturday, 10 in winter, 5 in summer; wages paid weekly; total number (union and non-union) employed at trade in locality, 50 to 60; all are members of organization; cash benefits, sickness, $5.40 per week; death, $100 to $200; out of work benefits, dues remitted. President, Reuben Casson, Welland P.O.; Corresponding Secretary, Edgar Jones, Box 272, Welland; meets first and third Wednesdays in month.

Westfort.

Name,—Brotherhood of Railway Carmen, No. 437. Organized October, 1911; total membership, 30; average earnings per week, $18; average earnings per hour, 26c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; average number of days idle per member during year, 60; general cause of idleness, holidays; total number (union and non-union) employed at trade in locality, 100; difference in wages or hours between members and non-members, very little difference. President, C. H. Smith, Minnesota Street, Fort William; Corresponding Secretary, S. Speed, 510 Laird Street, Fort William; meets last Tuesday in month.

Windsor.

Name,—Journeymen Barbers' International Union, No. 451. Organized Oct. 16, 1902; total membership, 26; average earnings per week, $12; average earnings per hour, 16c.; number of working hours first five days, 62½; number on Saturday, 16¼; wages paid weekly; average number of days idle per member during year, none except holidays; total number (union and non-union) employed at calling in locality, 35; difference in wages between members and non-members, $1 per week; cash benefits, sickness, $5 per week; death, $75 to $500; body incorporated and registered. President, William Holmes, 42 Sandwich Street; Corresponding Secretary, Arthur Wickens, 18 Oulette Avenue; meets fourth Wednesdays in month.

Name,—Bricklayers', Masons' and Plasterers' International Union, No. 6. Organized 1895; total membership, 50; average earnings per week, $25; average

earnings per hour, 55c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly and fortnightly; average number of days idle per member during year, 90; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 50; no difference in wages or hours between members and non-members; cash benefits, death, $50 to $300. President, C. S. Chissuss, 85 Pierce Avenue; Corresponding Secretary, Rupert G. Thompson, 72 Cameron Avenue; meets every Tuesday in month.

Name,—Order of Railway Conductors, No. 494. Organized 1900; total membership, 41; average earnings per week, $18; average earnings per hour, 30c.; number of working hours first five days, 50; number on Saturday, 10; wages paid monthly; no idle days; total number (union and non-union) employed at calling in locality, 50; no difference in wages or hours between members and non-members; cash benefits, death insurance optional; body incorporated and registered. President, M. J. Nester, Labelle Terrace; Corresponding Secretary, G. Jackson, 114 Goyeau Street; meets second and fourth Sundays in month.

Name,—National Association of Marine Engineers, No. 11. Organized June, 1903; total membership, 10; average earnings per month, $95; number of working hours first five days, 60; number on Saturday, 12; wages paid monthly; average number of days idle per member during year, 3 of our members are idle during the 3 winter months when navigation is closed; the rest, being on car ferries, work the year round; total number (union and non-union) employed at calling in locality, 30; no difference in wages or hours between members and non-members. President, Alex. McDonald, 28 Crawford Avenue; Corresponding Secretary, Neil Maitland, 221 London Street West.

Name,—Brotherhood of Locomotive Firemen and Enginemen, No. 421. Organized June 6, 1890; total membership, 45; average earnings per week, $20; average earnings per hour, 25c.; number of working hours first five days, 60; number on Saturday, 12; wages paid monthly; general cause of idleness, leave of absence or sickness; no difference in wages or hours between members and non-members; death benefit, amount of insurance; body incorporated and registered. President, J. L. Pero, 69 Arthur Street; Corresponding Secretary, A. R. Butler, 28 Glengarry Avenue; meets fourth Tuesdays in month.

Name,—United Garment Workers of America, No. 190. Organized 1908; total membership, male, 11; female, 212; average earnings per week, male, $12; female, $11.12; average earnings per hour, male, 25c.; female, 23c; number of working hours first five days, 43¾; number on Saturday, 4¼; wages paid weekly; average number of days idle per member during year, 21; general cause of idleness, stock-taking; all are organized. President, Miss Emma Overs, 126 Assumption Street; Coresponding Secretary, Miss Eva Grondin, Walkerville; meets second Wednesday in month.

Name,—Brotherhood of Painters, Decorators and Paperhangers of America, No. 629. Total membership, 8; average earnings per week, $14; average earnings per hour, 30c.; number of working hours first five days, 40; number on Saturday, 4 for three months in the summer only; wages paid weekly; average number of days idle per member during year, 60; general cause of idleness, winter weather; total number (union and non-union) employed at trade in locality, about 100; no difference in wages or hours between members and non-members; death benefits, $150 to 350; wife, $50. Corresponding Secretary, R. H. Brumpton, 64 Erie Street; meets first Tuesday in month.

Name,—Operative Plasterers' International Union, No. 345. Organized Nov. 13, 1905; total membership, 13; average earnings per week, $20 to $25; average

earnings per hour, 50c.; number of working hours first five days, 45; number on Saturday, 5; wages paid fortnightly; average number of days idle per member during year, 80; general cause of idleness, slackness in trade and bad weather; death benefit, $50; body incorporated. Corresponding Secretary, Chas. MacVoy, 55 Elliott Street; meets Thursdays.

Name,—United Association of Plumbers, Gas and Steam Fitters, etc., No. 552. Organized November, 1911; total membership, 46; average earnings per week, $21; average earnings per hour, 47½c.; number of working hours first five days, 45; number on Saturday, 5; wages paid weekly; average number of days idle per member during year, 38; general cause of idleness, lack of material; total number (union and non-union) employed at trade in locality, 52; cash benefits, sickness, $5 per week; death, $100; out of work benefits, $5 per week; body registered. President, P. Smith, Windsor; Corresponding Secretary, A. C. Longley, Box 242, Walkerville; meets first and third Fridays in month.

Name,—Amalgamated Sheet Metal Workers' International Alliance, No. 320. Organized Dec. 15, 1911; total membership, 18; average earnings per week, $18; average earnings per hour, 33¼c.; number of working hours first five days, 45; number on Saturday, 4½ in summer and 9 in winter; wages paid weekly; average number of days idle per member during year, 50; general cause of idleness, weather conditions; total number (union and non-union) employed at trade in locality, 26; difference in wages and hours between members and non-members, working hours are 8, 9, and 10, one at 8; body incorporated and registered. President, J. H. Mason, London Street East; Corresponding Secretary, C. H. Carley, 20 Aylmer Avenue; meets second and fourth Fridays in month.

Name,—Switchmen's Union of North America, No. 184. Organized January, 1904; total membership, 14; average earnings per week, $23.27; average earnings per hour, 35c.; number of working hours first five days, 55; number on Saturday, 11 or 12; wages paid monthly; total number (union and non-union) employed at calling in locality, 64; no difference in wages or hours between members and non-members. President, T. Barrows, Campbell Avenue; Corresponding Secretary, J. J. Lonnie, 68 Crawford Avenue; meets first Sunday and third Thursday in month.

Name,—Brotherhood of Railroad Trainmen, No. 316. Organized 1898; total membership, 122; average earnings per week, $22; wages paid monthly; general cause of idleness, slackness of trade in summer season; total number (union and non-union) employed at calling in locality, 122; no difference in wages or hours between members and non-members; body incorporated and registered. President, F. V. Addison, 64½ Oak Avenue; Corresponding Secretary, Chas. Wildrick, 168 Dougal Avenue; meets second and fourth Sundays; first and third Wednesdays in month.

Name,—International Typographical Union, No. 553. Organized Sept. 30, 1907; total membership, 18; average earnings per week, $14; average earnings per hour, 29¼c.; number of working hours first five days, 43½; number on Saturday, 4½; wages paid weekly; total number (union and non-union) employed at trade in locality, 18; cash benefits, death. President, Walter Black, 137 Janet Avenue; Corresponding Secretary, George E. Marentette, 98 Albert Street; meets last Sunday in month.

WOODSTOCK.

Name,—Bricklayers', Masons' and Plasterers' International Union of America, No. 22. Organized Dec. 5th, 1902; total membership, 20; average earnings per

week, $23; average earnings per hour, 45c.; number of working hours first five days, 45; number on Saturday, 9; wages paid fortnightly; average number of days idle per member during year, 150; general cause of idleness, severity of winter; total number (union and non-union) employed at trade in locality, 20; death benefit, $50 to $300; body incorporated and registered. President, Fred Adams, 501 Grace Street; Corresponding Secretary, Arthur Howe, 505 Vincent Street; meets second and fourth Tuesdays in month.

Name,—International Moulders' Union, No. 249. Total membership, 22; average earnings per week, $18; average earnings per hour, 30c.; number of working hours first five days, 50; number on Saturday, 9; wages paid weekly; average number of days idle per member during year, 50; general cause of idleness, trade slack; total number (union and non-union) employed at trade in locality, 47; difference in wages between members and non-members, 50c. per day; cash benefits, sickness, $5 per week; death, $100; out of work benefits, dues remitted; body incorporated and registered. President, George E. Slagher, General Delivery; Corresponding Secretary, H. E. Porter, Box 746; meets third Friday in month.

Name,—Journeymen Tailors' Union of America, No. 33. Organized Dec. 4, 1890; total membership, male, 5; female, 5; average earnings per week, male, $14; female, $8; average earnings per hour, male, 25c.; female, 15c.; number of working hours first five days, 45; number on Saturday, 9; wages paid fortnightly; average number of days idle per member during year, 12; general cause of idleness, vacation and sickness; total number (union and non-union) employed at trade in locality, male, 9; female, 8; cash benefits, sickness, $5 per week; death, $200; body incorporated and registered. President, Joseph Cross, Woodstock; Corresponding Secretary, R. N. Heppenstock, Box 605, Woodstock; meets third Tuesday in month.

Name,—International Typographical Union, No. 317. Organized Oct. 7, 1909; total membership, male, 19; female, 2; number of working hours per week, 48, day work; 45, night work; wages paid weekly; total number (union and non-union) employed at trade in locality, 8. President, Walter Stallan, care Express Printing Co.; Corresponding Secretary, J. G. Reid, Box 758, Woodstock; meets Mondays in month.

SUGGESTIONS FROM LABOUR ORGANIZATIONS.

Bricklayers', Masons' and Plasterers' Union, No. 30, Belleville. We think that Government jobs in Belleville should employ union men in the case of repairing Post Office building and sidewalks around Post Office. A Dominion matter. Secretary, Labour Bureau.

Journeymen Barbers' International Union of America, No. 298, Brantford. Our Union believes a medical health officer should be appointed to examine health of barbers and also to see that shops are kept sanitary.

Amalgamated Society of Carpenters and Joiners, Brantford. In the opinion of our Society a system of taxation which was based on land values and *not on property*, on unearned increment, and *not on industry*, would tremendously benefit the building trades, as it would induce many to demolish comparatively worthless buildings and replace them by something more worth while.

International Moulders' Union, No. 29, Brantford. There should be baths and dressing rooms and fans to take out gas and smoke.

International Association of Machinists, No. 535, Chapleau. Members of our Lodge unanimously favour fortnightly payments and regret that one prominent trade unionist blocked this Bill last session in the Provincial Parliament.

Western Federation of Miners, No. 146, Cobalt. We want an 8-hour day, as the mines are not well ventilated, and hydraulic air is used in many of the mines. A candlelight cannot burn underground. You can draw your own conclusions.

Order of Railway Telegraphers, Div. No. 39, Coatsworth. We suggest the making of a law that any one employed as agent or operator on any railway in the Province who works daily over ten hours each day, if compelled to work on Sunday, the railway should furnish a man to relieve him one day per week, which may be Monday or Tuesday, no matter the day as long as he has one day's rest in the week. Twelve hours is too long to work seven days per week, and it should not be necessary for our Organization to bring in a Bill. It should be taken up by any member friendly to justice.

Amalgamated Society of Carpenters and Joiners, Collingwood. We would suggest that union rate of wages should be paid to all organized labour in regard to Government work done in this town in the near future and a stipulation made to this effect when contracts are let. This is the rule now. Secretary, Labour Bureau.

International Brotherhood of Paper Makers, No. 156, Espanola. Our members are very much in favour of the 8-hour work day.

International Brotherhood of Maintenance of Way Employees, Div. No. 128, Fort William. We want the Alien Labour Act so amended as to be of some benefit to the working people; a general 8-hour work day, so as to have a little part of our lives with the harness off; a Workmen's Compensation Act; amendments to the Elections Act with abolition of dual voting on money by-laws and abolition of the bonusing system; and old age pensions for the workers. We are aware most of these remarks apply to measures under the jurisdiction of the Dominion House, but we submit them all so the Ontario Department can see what is needed.

United Brotherhood of Carpenters and Joiners, No. 1,216, Galt. Employers should be looked after who are engaging men in the British Isles with a promise of $3 per day and when they get here they give them $2 per day. This can be proved.

Journeymen Barbers' International Union, No. 131, Hamilton. A Barbers' License Law would be of great value to our trade both from a financial and sanitary standpoint.

Canadian Association of Stationary Engineers, No. 2, Hamilton. If the Stationary Engineers' Board had more power to enforce the present law it would be good. Then grade your certificates and pay a man what he is worth.

International Moulders' Union, No. 26, Hamilton. We require better sanitation and proper heating and ventilating appliances.

Amalgamated Sheet Metal Workers' International Alliance, No. 61, Hamilton. Our members want an 8-hour day; also an inspector to see that all scaffoldings on which we have to work are made in a proper and safe way, including all the building trades.

Brotherhood of Railway Carmen of America, Lake of the Woods Lodge, No. 236, Kenora. We suggest the following: (1) Sheds for repairing cars; that (2) a ladder be placed in bunkers of all heated cars, for in the majority of cars there is no means of getting out when attending to heaters, except to clamber out, which is a source of considerable danger in the event of a heater exploding; relay men should not be required to work 24 hours in changing over day to night shifts.

Federated Association of Letter Carriers, No. 8, Kingston. There should be an amendment to the Post Office Act regulating the number of hours, making eight hours to constitute a day's work; also a stated limit to the weight of mail a carrier should be called upon to carry, the same as is done in England and the United States. It would be a humane act on the part of the Department. A Dominion matter. Secretary, Labour Bureau.

National Association of Marine Engineers, No. 4, Kingston. There is no law governing the number of hours a marine engineer should be on watch, or law stating the number of engineers any steamer should carry, which we think is very requisite.

Canadian Association of Stationary Engineers, No. 30, London. The Stationary Engineers' Act came into force January, 1908, and granted one grade of certificate regardless of merit or service. We want graded certificates, 1st, 2nd, 3rd and 4th, like school teachers. A member's study and attention to his calling entitle him to something better than a journeyman's pay.

International Alliance of Theatrical Stage Employees, No 105, London. All theatres should have a door and fire escape direct from the fly gallery to the outside of the theatre and should have fire axes to cut down all hanging scenery.

Grand Trunk Railway System, Div. No. 1, London. There should be legislation passed prohibiting any railway company working employees in the station and train service more than eight (8) hours per day.

International Union of Steam Engineers, No. 232, Niagara Falls. The members of our local earnestly solicit legislation regarding provincial hoisting engineers' license law as a protection to life and property.

Brotherhood of Carpenters and Joiners of America, No. 93, Ottawa. We wish that Government contractors shall pay the wage that the public are paying. This is the rule now. Secretary, Labour Bureau.

Brotherhood of Railway Trainmen, Jubilee Lodge, No. 129, Ottawa. We would strongly suggest an eight-hour day instead of twelve for all men working in such hazardous calling as yard brakemen in all big yards, as twelve hours break a man down in five years.

Canadian Association of Steam Engineers, No. 25, Owen Sound. If engineers were issued graded certificates it would be beneficial to our calling. Our Lodge in general and also the Organization are fighting to attain that end. Another suggestion would be to make the present examination harder and also to make candidates get more percentage.

Bricklayers' and Masons' International Union, No. 17, Peterborough. It would be a wise policy if the Department would discourage mechanics emigrating to Ontario from the Old Country. They are not encouraged. Secretary, Labour Bureau.

Canadian Association of Stationary Engineers, No. 29, Port Arthur. We believe that graded certificates would improve our condition greatly. We believe it would be to the safety of the general public if the Government would appoint Government Boiler Inspectors in every district.

International Longshoremen's Association, No. 319, Port Arthur. What is needed in this class of work is eight-hour shifts with a salary instead of wages so that men would be paid for the time they wait on the company; also a bath house on the dock and worker's clothes closet, so that men can come to work and leave decently.

Plumbers, Steam Fitters and Helpers, No. 378, Port Arthur. We would like, if it were possible, to get an Act passed to make it legal to tax plumbing shops in

the Province as it would assist the work to be kept in the city or country rather than having work taken by large American firms from under your nose.

International Association of Machinists, No. 294, St. Thomas. Our Union would suggest a more thorough inspection of factories along the lines of ventilation, and regular visits to be made by inspectors once or twice a month at least, practical machinists to be appointed when vacancies occur, and a closer tab to be kept on factory inspectors in order to see that they are doing their duty as outlined by the Factories Act.

International Moulders' Union, No. 391, Sault Ste. Marie. It has often been suggested by organized labour of this town that monthly payment should be abolished all over the country, especially where cheques are in use. The law, I believe, now forbids bar-rooms to cash these cheques, and where there exists several different days for paying, the banks always open their doors on the last pay night. Recently a small store was used for the cashing of cheques, the private persons charging 10c. straight and also the odd cents whatever they may be. In my own case 14c. was the charge for a cheque to be cashed. We also believe that the Government should compel all firms to close on Saturday afternoons during summer months and give the working class some recreation which one is not permitted to enjoy on Sunday.

International Association of Machinists, No. 69, Schreiber. We think that pressure should be brought to bear on the railway companies to make them accept the award of arbitration boards findings, otherwise arbitration is a failure; also, we wish to see the blacklist practised by railway companies and manufacturers in general against their employees be abolished. When an employee leaves the service of a railway company he has placed against him a charge of desertion which disqualifies him from again seeking employment on the same road and often debars him from employment on other roads. This is known as the personal record system, I believe.

Journeymen Barbers' International Union of America, No. 517, Toronto. We think that owing to poor sanitary conditions in many barber shops it would be well if the Government would enact a Sanitary Act as well as an Act to protect the trade like they have in many States in the Union.

United Brotherhood of Carpenters and Joiners of America, No. 1,820, Toronto. We think that all furniture and cabinet work done for the Government should be made under Union conditions. In case of contract Union conditions are required. Secretary, Labour Bureau.

International Brotherhood of Electrical Workers, No. 114, Toronto. We think the Workmen's Compensation Act, as is in force in Great Britain, would be a good thing for the workmen of Canada; also that all advertisements for mechanics where there is a strike on should read: "There is a strike on," or other words to this particular effect. A Workmen's Compensation Act will be laid before the Legislature in the coming session. Secretary, Labour Bureau.

Brotherhood of Locomotive Firemen and Enginemen, No. 262, Toronto. We would suggest that no railway engineman should be allowed to be on duty more than 16 hours at any one time, as such long hours of duty endanger the life of enginemen as well as the public.

International Brotherhood of Stationary Firemen, No. 300, Toronto. We are working to establish the eight-hour day, as many of our craft have to work seven days a week. We would suggest that the Department of Public Works should assist us in this matter and in getting legislation to the effect that all firerooms and boiler

houses should be properly ventilated. Also that firemen who are in charge of heating plants should be licensed.

International Moulders' Union of North America, No. 28, Toronto. We would like stricter inspection by Factory Inspectors as to ventilation and heating of foundries and more attention paid to the sanitary conditions.

Amalgamated Association of Street and Electric Railway Employees of America, No. 113, Toronto. Now that 20 of the open cars have been burnt, we desire to have the new open cars constructed with aisles down the centre, so as to do away with the running board on the side, as it is dangerous to life and limb of passengers and employees. This is urgent and comes under the provisions of the Ontario Railway and Municipal Act, 1906.

Brotherhood of Railway Trainmen, No. 322, Toronto. Compensation for injuries and old age pensions is what we desire. A Compensation Act will be introduced in the Legislature next session. Secretary, Labour Bureau.

Waiters' Union, No. 300, Toronto. We would suggest that the Government pass a law making it compulsory for hotel employees to have one day off in seven, as we work longer on Sundays than any other day.

Amalgamated Society of Carpenters and Joiners, No. 809, Welland. We would like to have introduced a Workmen's Compensation Act similar to one in England Such an Act will be laid before the Legislature in the coming session. Secretary, Labour Bureau.

Name of Organization.	Name of President.	President's Address.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
Allandale:					
Brotherhood of Railway Conductors, No. 355	A. B. Garrettson.	Cedar Rapids, Iowa	Jas. P. McMillin.	Box 35, Cumberland St., Allandale	3rd Sunday.
Brotherhood of Locomotive Engineers, No. 436	T. C. Royce	Box 212, Allandale	John Logue	Box 24, Allandale	1st Sunday and 3rd Monday.
Brotherhood of Railway Trainmen, No. 377	C. McNiven	Box 64, Allandale	W. H. Fell	Burton Ave., Allandale	2nd Wednesday, 8 p.m.; 4th Sunday, 2.30 p.m.
Amherstburg:					
Divers, Tenders and Derrickmen, No. 377	Robt. Kitt	Amherstburg	Albert Brown	Amherstburg	1st Monday.
International Rock Drillers' Association	Robt. Kitt	Amherstburg	Lemuel A. Parker	Amherstburg	1st Monday.
International Brotherhood of Steam Shovel and Dredgemen, No. 20	W. G. Raines	Amherstburg	J. J. Ryan	Box 196, Amherstburg.	Call of officers.
Beaverton:					
Brotherhood of Maintenance of Way Employees, No. 262	W. C. Doxsee	Staney Brae	F. Quinton	Udney	
Belleville:					
Bricklayers', Masons', etc., Union, No. 30	Wm. Johnson	Belleville	Alonzo G. Coe	Mill St., Belleville	1st and 3rd Mondays.
Brotherhood of Locomotive Engineers, No. 189	Wm. Rogers	Station P.O., Belleville.	H. Lavoie	Box 34, Station P.O.	1st and 3rd Sunday, 2.30 p.m.
Brotherhood of Locomotive Firemen and Enginemen, No. 66	W. V. Fairbairn	Belleville Station	Robt. J. Milne	Belleville Station	2nd and 4th Tuesdays, 2.30 p.m.
Berlin:					
Journeymen Barbers' International Union, No. 304	Chas. Knapp	Courtland Ave., Berlin.	F. J. Fitt	c/o Julius Jaeger, King St., Berlin	3rd Monday.
Brewery Workers' Union, No. 170	Wm. Mussel	Park St., Waterloo	Jos. Boegel	Box 221, John Street, Waterloo	2nd and 4th Tuesdays.
Bricklayers' and Masons' Union, No. 12	O. P. Plummer	168 Weber St. E., Berlin	Albert J. Weber.	345 King St. W., Berlin	Every Friday.
Brotherhood of Carpenters and Joiners, No. 553	Dav. Mather	Charon St., Berlin	Geo. Vogt	118 Ahrens St. W., Berlin	1st and 3rd Fridays.
Cigarmakers' International Union, No. 422	Leo. Sobisch	Waterloo	S. Welheuser	22 Troy St., Berlin	2nd Tuesday.

Boot and Shoe Workers' Union, No. 206	Wm. Harlock	105 Charles St., Berlin.	Herman W. Oberer	130 Louisa St., Berlin.	2nd and 4th Fridays.
Hodcarriers' and Building Labourers' Union, No. 160	Herman Godan.	Waterloo St.	Geo. Hofmann	58 Homewood Avenue, Berlin	1st and 3rd Wednesdays.
Federal Labour Union, No. 17	T. Ackernecht	36 Frederick St., Berlin	A. Wildfong	30 Richmond Ave., Berlin	1st and 3rd Thursdays.
Federal Association Letter Carriers	W. Witzel	Berlin	W. H. Halliwell.	Berlin.	
Musicians' Protective Association	E. C. Schultz	26 Brubacher St., Berlin	G. A. Albrecht	151 Wellington Street, Berlin	
United Association Plumbers and Steamfitters, No. 527	Geo. Zimmerman.	Waterloo	E. R. Reitz	57 William St., Berlin.	1st and 3rd Mondays.
Journeymen Tailors' Union of America, No. 264	Geo. Tilsinger	79 Ahrens St.	A. H. Duerch	42 Cedar St. N.	1st Tuesday.
Blenheim:					
Brotherhood of Maintenance of Way Employees, No. 502	A. Mansel	Blenheim	Steph. Tilley	48 Park Ave. W., Chatham	Call of President.
Bowmanville:					
Glove Workers' Union, No. 43	W. Pearl	Bowmanville	J. D. Clute	Bowmanville	2nd Friday.
Brantford:					
Journeymen Barbers' International Union, No. 298	Jas. Rice	5 George St., Brantford	Ernest Deagle	395 Colborne St., Brantford	Last Monday.
Bartenders' International Union, No. 182	Dennis Kavanagh	Bodega Hotel	Chas. Benwell	Benwell Hotel	Last Sunday afternoon.
Bricklayers', Masons', etc., International Union, No. 9	A. Fischer	Grandview P.O.	B. E. Pearcey	74½ Erie Ave., Brantford	Alternate Thursdays from April 18.
Amalgamated Society of Carpenters and Joiners, No. 783	Ch. McInnes	23 North Park Street, Brantford	J. W. Harris	9 Young St., Brantford	Alternate Mondays from January 4.
United Brotherhood Carpenters and Joiners, No. 498	Albert G. Brown.	Grandview P.O.	Jos. Swift	292 Park Ave., Brantford	2nd and 4th Tuesdays.
Canadian Association of Stationary Engineers, No. 4	A. Ames	159 Chatham Street, Brantford	Jos. Ogle	73 Richmond Street, Brantford	2nd and 4th Fridays.
Fed. Association of Letter Carriers, No. 13	Frank Jones	36 Troy St., Brantford.	Lloyd E. Smith.	10 Pearl St., Brantford	1st Saturday.
International Moulders' Union, No. 29	John Symons	Brantford	C. J. Crowley	471 Colborne St.	Alternate Mondays.
Painters', Decorators', etc., No. 313	Thos. Hill	9 Marlborough Street Brantford	C. H. Jones	93 Arthur St., Brantford	1st Monday.
Oper. Plasterers' International Association, No. 164	H. G. Girdlestone	124 Northumberland St., Brantford	H. Perrin	7 Holmes St.	2nd and last Thursday.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
Brantford.—*Continued.*					
Journeymen Plumbers, Gas and Steamfitters, No. 186	Jas. Ballantyne	73 Brant St.	Jas. W. Groucher	51 Church St., Brantford	1st and 3rd Tuesdays.
Journeymen Tailors' Union of America, No. 117	Rich. Mowbray	118 Albion St., Brantford	Belle Sisson	141 Colborne St., Brantford	4th Tuesday.
Typographical Union, No. 378	W. D. Reeves	119 Terrace Hill St., Brantford	Ira D. Scruton	112 Sydenham Street, Brantford	4th Wednesday.
Bridgeburg:					
United Brotherhood of Carpenters and Joiners, No. 1,850	Wm. Armstrong	Bridgeburg	Hugh Brown	Bridgeburg	1st and 3rd Mondays.
Brotherhood of Railway Carmen, No. 10	...	...	A. Merryweather.	Bridgeburg	
Brotherhood of Locomotive Engineers, No. 679	Rich. Walsh	1892 Niagara Street, Buffalo, N.Y.	M. R. Harvey	Bridgeburg	1st Wednesday, 2nd Tuesday.
Brockville:					
Journeymen Barbers' International Union of America, No. 387	Thos. Goodison	75 Church St., Brockville	Fred. J. Clutterbuck	7 King St. W., Brockville	Last Monday.
United Brotherhood of Carpenters and Joiners, No. 799	L. B. Kerr	32 King St., Brockville	N. Young	Brockville	Thursdays.
Brotherhood of Locomotive Engineers, No. 118	E. Mortimer	Charles St., Brockville.	R. Wardrop	39 Daniel St., Brockville	Tuesdays, 7.30 p.m.
International Moulders' Union, No. 329	John Monahan	Brockville	Chas. Gochie	122 Abbott St., Brockville	1st and 3rd Tuesdays.
Journeymen Tailors' Union of America, No. 262	E. Enright	Church St., Brockville.	A. S. Hamilton	24 John St., Brockville.	1st Monday.
Carleton Place:					
International Brotherhood Blacksmiths, etc., No. 424	Sam. Hale	Carleton Place	R. G. Curtis	Box 224, Carleton Place	Last Saturday.
International Association of Machinists, No. 211	John Dunfield	Carleton Place	J. H. McFadden.	Box 326, Carleton Place	2nd and 4th Thursdays.
Maintenance of Way Employees, No. 222	Jas. McLain	Carleton Place	I. P. Steele	Box 313, Carleton Place	Last Saturday.

Metal Polishers, Buffers, etc., Union, No. 96	E. J. Cunningham	Carleton Place	A. P. Williamson.	Box 168, Carleton Place	1st and 3rd Thursdays.
International Moulders' Union, No. 362	J. G. McPhail...	Carleton Place	J. J. Carson	Box 292, Carleton Place	3rd Thursday.
Brotherhood of Railway Carmen, No. 229	Thos. Carson	Carleton Place	Jas. Richards	Carleton Place	4th Thursday.
Stove Mounters, etc., International Union, No. 78	J. C. Beck	Carleton Place	W. J. Saunders..	Box 301, Carleton Place	2nd and 4th Thursdays.
Chapleau:					
Brotherhood of Locomotive Engineers, No. 319	P. Downey	Chapleau	B. Warner	Box 158, Chapleau	Mondays, 2 p.m.
Brotherhood of Locomotive Firemen and Enginemen, No. 321	A. St. Amand ..	Chapleau	A. Clifton	Box 114, Chapleau	Wednesdays, 2 p.m.
International Association of Machinists	J. A. Dion	Box 57, Chapleau	D. Beardmore	Box 57, Chapleau	2nd and 4th Wednesdays.
Maintenance of Way Employees, No. 237	R. J. O'Hearn	Chapleau	N. Darby	Woman River, Ont.	Last Saturday.
Chatham:					
Canadian Association of Stationary Engineers, No. 21..	Sam. D. Keats ..	Witherspoon St., Chatham	Wm. Congdon ..	Dover St., Chatham	Every Thursday.
United Garment Workers' Union, No. 44	Myrtle Tyndall..	Chatham	Edith Kennedy..	Chatham	Last Tuesdays.
Typographical Union, No. 421.	Art. J. Cartier ..	Lorne Ave., Chatham..	Andrew Riddell..	Taylor Ave., Chatham.	1st Monday.
Coatsworth:					
Order of Railway Telegraphers, No. 39	H. B. Perham	St. Louis, Mo.	L. W. Quick	St. Louis, Mo.	Call of Gen. Chairman.
Cobalt:					
Miners' Union, No. 146, W. F. of M.	Mat. O'Farrell...	Box 446, Cobalt	Albert Nap. Gauthier	Box 446, Cobalt	Sundays, 2 p.m.
Order of Railway Telegraphers, No. 99	J. B. Flaglar....	Englehart	R. Richardson ..	Tomico	1st Sunday.
Cobourg:					
International Moulders' Union, No. 189	Robt. Barnt	Port Hope	Reuben Bennett..	Port Hope	1st and 3rd Mondays.
Colborne:					
Brotherhood of Maintenance of Way Employees, No. 288.	G. H. Mason	Cobourg	H. Hennesey	Colborne	3rd Friday.
Collingwood:					
Journeymen Barbers' International Union, No. 528	Leonard Fryer .	Huron St., Collingwood	Fred. L. Bollen .	Box 536, Collingwood .	1st and 3rd Mondays.
Bricklayers' and Masons' Union, No. 19	John Gilham	Box 777, Collingwood..	Willis Court	Box 797, Collingwood .	3rd Wednesday.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
Colborne.—*Continued.*					
Amalgamated Society of Carpenters and Joiners, No.	S. Brooks	Collingwood	R. Fleetham	Box 420, Collingwood	Saturdays.
Labourers' Protective Union, No. 14106	Robt. McBennie	Robinson St., Collingwood	Robt. Boyce	Sixth St., Collingwood.	2nd and 4th Fridays.
International Longshoremens' Association, No. 476	W. G. Nutt	St. Marie St., Collingwood	Wm. Turnbull	Napier St., Collingwood	1st and 3rd Thursdays
Amalgamated Society of Engineers	Arthur Fairhurst	21 St. Marie St., Collingwood	Thos. Kelly	Hurontario St., Collingwood	Saturdays.
Cornwall:					
Journeymen Tailors' Union of America, No. 5679	J. Delbeck	First St., Cornwall	Hugh McDonald	Pitt St., Cornwall	1st Monday.
Crookston:					
Journeymen Stonecutters' Association, of North America			Fred. McCauley	Crookston	
Deseronto:					
Order of Railway Telegraphers, No. 43	S. Thomas	Tamworth	R. A. McKeown	Box 263, Deseronto	Annually.
Dundas:					
International Moulders' Union No. 269	M. J. Dunn	Box 117, Dundas	Geo. S. Scott	Box 239, Dundas	3rd Monday.
Elk Lake:					
Western Federation of Miners, No. 140	F. G. Macleod	Box 348, Elk Lake	Len. Wyatt	Box 348, Elk Lake	Sunday afternoon.
Elmira:					
International Woodworkers of America, No. 129	Thos. Dillon	South St., Elmira	Sol. B. Frey	Park Ave., Elmira	Last Tuesday.
Espanola:					
International Brotherhood of Paper Makers, No. 156	Robt. Greig	Espanola	H. H. Brant	Espanola	2nd and 4th Sundays.
Essex:					
Brotherhood of Maintenance of Way Employees	A. B. Lowe	3900 Olive St., St. Louis, Mo.	Sam. J. Pegg	3900 Olive Street, St. Louis, Mo.	Biennially.
Fort Frances:					
Brotherhood of Maintenance of Way Employees, No. 313	A. R. Revill	Mine Centre	F. McNarney	La Vallee	No special day.

Fort William:					
Bartenders' Union, No. 761	Robt. Brebner	385 Simpson St., Ft. William	Roy Carson	215 Bethune St., Fort William	Sunday aft. twice in month.
International Brotherhood of Boilermakers, etc.	Edw. Thompson.	411 Prince Arthur Boulevard	Fred. Stafford	420 Mary St., Fort William	1st and 3rd Friday.
Bricklayers', Masons, etc., Union, No. 25	P. Hartley	34 Shuniah Rd., Port Arthur	Arthur Scarlett	107 Empire Ave., Port Arthur	2nd and 4th Monday.
International Association of Bridge and Structural Iron Workers, No. 53	W. J. Mason	128 Harold St., Fort William	Rod. Young	Box 182, Fort William.	1st and 3rd Friday.
Amalgamated Society of Carpenters and Joiners	H. Edwards	134 Franklin St., Fort William	G. H. Dutton	107 Vickars St., Fort William	1st and 3rd Mondays.
Order of Railway Conductors No. 286	D. U. Beaton	346 N. Syndicate St., Ft. William	A. B. Marcotte	439 Wiley St., Fort William	2nd and 4th Sunday, 14—30.
Brotherhood of Locomotive Engineers, No. 243	H. Mills	231 Pruden St., Fort William	W. G. Smyth	407 Prince Arthur Boulevard	2nd and 4th Thursday.
Brotherhood of Locomotive Firemen and Enginemen No. 308	Jas. Rumsey	124 W. Amelia St., Ft. William	Gilbert McNab	192 Empire Ave., Fort William	1st and 3rd Sunday.
International Longshoremen's Association, No. 479 (Grain Trimmers)	W. Houston	215 S. Brodie St., Ft. William	Budd Ellis	113 S. Vickars St., Fort William	1st Wednesday.
International Longshoremen's Association, No. 746 (Coal Handlers)	Nicholas Hominico	539 McLaughlin St., Ft. William	Arthur Jarratt	Ogden St., Ft William	3rd Tuesday.
International Association of Machinists, No. 309	Jas. Wilkinson	414½ N. May St., Ft William	H. Stafford	138 Heron St., Fort William	2nd and 4th Tuesday.
Brotherhood of Maintenance of Way Employees, No. 128	W. J. Stinson	125 Leith St., Fort William	A. Rowe	320 N. Harold St., Fort William	4th Saturday.
International Moulders' Union No. 429	Thos. Morris	430 Vickars St., Fort William	Wm. Newman	806 Northern Ave., Fort William	1st and 3rd Wednesday.
United Association of Plumbers, etc., No. 257	C. Stanch	c-o Anderson & Co.	R. Schermdt	112 St. John's St., Fort William	2nd Thursday.
Brotherhood of Railway Trainmen, No. 306	I. J. Nagle	Fort William	Fred. Hutchins	307 Finlayson St., Fort William	1st and 3rd Sundays.
Typographical Union, No. 41	D. Ross	Box 396, Fort William.	Geo. E. Carter	Box 396, Fort William	1st Saturday.
Galt:					
Journeymen Barbers' International Union, No. 418	Allen Wilson	S. Water St., Galt	John R. Soutar	Box 1155, Galt	Last Monday.
Amalgamated Society of Engineers, No. 680	Wm. Oxtoby	Box 685, Galt	H. C. Brade	Box 1103, Galt	Wed., June 19 and alt. Wed.
International Association of Machinists, No. 120	Herman Ableson	Middleton St., Galt	John E. Fulton	Box 463, Galt	Alt. Mondays.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
Galt.—*Continued.*					
Bricklayers', Masons, etc., Union, No. 15	A. S. Underhill	Preston P.O.	W. R. Johnston	Box 208, Hespeler	1st and 3rd Wednesday.
United Brotherhood of Carpenters and Joiners, No. 1216	Wm. Rigsby	Galt	A. G. Robb	40 Henry St., Galt	1st and 3rd Monday.
International Moulders' Union, No. 447	Jos. E. Kent	Galt	Dav. Melvin	Box 356, Galt	1st and 3rd Thursday.
Typographical Union, No. 411	Frank Dorschell	N. Water St., Galt	Geo. J. Hogan	37 N. Water St., Galt.	1st Tuesday.
Graham:					
Brotherhood of Railway Carmen	W. Bonnin	Graham P.O.	John North	Graham P.O.	3rd Sunday.
Guelph:					
Journeymen Barber's International Union, No. 310	Joe Egan	5 Thorp St., Guelph	Alf. McCainsh	145 Windham Street, Guelph	Last Monday.
Bartenders' Union, No. 104	Wm. Mulvaney	American Hotel, Guelph	Robt. McCaw	Victoria Hotel, Guelph	1st Friday.
United Brewery Workers' No. 300	Antony Grusliske	69 Edinburgh Road, Guelph	W. Golding	9 Preston St., Guelph	1st Thursday.
Bricklayers', Masons' and Plasters' Union, No. 3	Ed. Simpson	13 George St., Guelph.	Wm. Cook Guelph	52 Tiffany St., Guelph.	2nd and 4th Thursday.
Letter Carriers' Association, No. 18	Harry Winters	50 Nottingham Street. Guelph	A. T. Pearson	261 Oxford St., Guelph	
International Moulders' Union, No. 212	W. J. Lucas	McDonnell St., Guelph.	Freeman W. Felk	114 Northumberland St., Guelph	Tuesday.
Piano, Organ and Musical Instrument Workers, No. 34	J. Cemidge	Dundas Rd., Guelph	Geo. Cutting	127 Paisley St., Guelph	1st and 3rd Friday.
Polishers, Buffers, etc., No. 56	W. Bolton	Wellington St., Guelph	A. Hutchison	Woolwich	3rd Thursday.
Typographical Union, No. 391	Thos. E. Hall	Herald Office, Guelph.	Fred. Kinsly	Box 104, Guelph	1st Wednesday.
Hamilton:					2nd Monday.
Journeymen Barbers' International Union, No. 131	Herrman Paro	200 George St., Hamilton	W. G. Walford	59 John St., S., Hamilton	1st and 3rd Monday.
Bartenders' International League, No. 197	Geo. Hibberd	123 James St., S., Hamilton	John Fair	24 Barton St., E., Hamilton	1st and 3rd Sunday.
International Brotherhood of Bookbinders, No. 114	John Glockling	33 Jones St., Hamilton	W. E. Monk	120 Lock St., N., Hamilton	Last Friday.

Boot & Shoe Workers' Union No. 228	Jos. Gimblett	East Av., N., Hamilton	H. Harrison	43 Melbourne Street Hamilton	3rd Tuesday.
Boot & Shoe Workers' Union No. 232 (Cutters)	P. J. Kennedy	218 John St., N., Hamilton	Thos. J. Connell.	31 Steven St., Hamilton	4th Tuesday.
Boot & Shoe Workers' Union, No. 234 (Female)	Annie Folland	205 Cannon St., E. Hamilton	Ethel Copeland	132 Markland Street Hamilton	4th Thursday.
Boot & Shoe Workers' Union, No. 444	Fred. Wills	163 Young St., Hamilton	W. H. Hamilton.	15 Hess St., S., Hamilton	2nd Friday.
International Brewery Workers' Union, No. 312	Geo. King	245 Young St., Hamilton	A. E. Bates	21 Barton Street, E Hamilton	2nd and 4th Tuesday.
Bridge and Structural Iron Workers, No. 95	Harry J. Cox	24 Norwood Ave., Hamilton	Don. Urquhart	25 Wood St., E., Hamilton	2nd and 4th Thursday.
International Broom & Whisk Makers' Union, No. 9	Jas. Petfield	75 E. Hunter St., Hamilton	Wm. H. McAdam	90 S. Catherine Street Hamilton	2nd Monday.
Amalgamated Society of Carpenters and Joiners, No. 855	Albert Pye	96 Wellington St., N. Hamilton	Archie Burton	46 Garfield Ave., S. Hamilton	Alt. Mondays.
United Brotherhood of Carpenters and Joiners, No. 18.	W. J. Frid	25 Nelson St., Hamilton	Albert Blythe	49 Wellington St., N. Hamilton	1st and 3rd Tuesday.
Brotherhood of Cement Workers, No. 170	John A. McNab	21 Tucket St., Hamilton	W. B. Irving	92 East Ave., N., Hamilton	1st and 3rd Monday.
Cigar Makers' Union, No. 55	C. J. Meadow	11 McNab St., Hamilton	T. Hugh	170 Duke St., Hamilton	2nd Tuesday.
Order of Railway Conductors, No. 27	H. Mander	64 Strachan St., E., Hamilton	A. Cameron	297 York St., Hamilton	1st and 3rd Sunday. 2.30 p.m.
Brotherhood of Locomotive Engineers, No. 133	Jos. Olliver	198 Lock St., N., Hamilton	A. Griffith	193 Napier St., Hamilton	2nd and 4th Sunday.
Canadian Association of Stationary Engineers, No. 2	W. Lamberton	19 Cannon St., W., Hamilton	A. W. Heath	111 Burns St., Hamilton	2nd and 4th Thursday.
Brotherhood of Locomotive Firemen and Enginemen, No. 151	Geo. Thedorff	91 Robert St., Hamilton	Thos. McQueen	56 Strachan St., W., Hamilton	1st and 3rd Sunday, 2.30 p.m.
United Garment Workers of America, No. 250	M. Lavine	25 Burley St., Hamilton	S. L. Landers	39 Charles St., Hamilton	Every Second Tuesday.
International Journeymen Horseshoers, No. 72	Wm. R. Allen	139 Caroline St., S., Hamilton	Albert Decker	83 Smith Av., Hamilton	2nd Wednesday.
Federal Labour Union, No. 11 (City Firemen)	Jas. McHendrie	11 Stuart S., W., Hamilton	Jas. Hobium	251 Wellington St., N., Hamilton	1st Monday.
Lathers, Wood, etc., Union, No. 145	Henry Potter	26 Holton Ave., Hamilton	D. Gilmour	147 Lottridge St., Hamilton	1st and 3rd Wednesday
International Longshoremen's Association, No. 792	Arthur Hill	15 Murray St., W., Hamilton			2nd and 4th Thursday.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
Hamilton.—*Con.*					
International Moulders' Union, No. 26	Thos. Church	81 Pearl St., N., Hamilton	Jas. W. Ripley	159 Mary St., Hamilton	Every Wednesday.
Musicians' Protective Association, No. 93	A. J. Milligan	81 Peter St., Hamilton	Jos. Gimblett	120 East Av., N., Hamilton	2nd Sunday afternoon.
Brotherhood of Painters, Decorators, etc., No. 205	Edw. Foley	146 Hughson St., S., Hamilton	Geo. Purcell	76 Main St., W., Hamilton	1st and 3rd Monday.
Operative Plasterers' International Union, No. 298	R. J. Jocelin	Woodbine Cres., Hamilton	Geo. Anderson	Chedoke P. O.	1st and 3rd Thursday.
Polishers, Buffers, etc., No. 26	C. Manvell	99 Edinburgh Ave., Hamilton	D. Irvine	60 Edinburgh Ave., Hamilton	1st and 3rd Wednesday.
Pressmen & Assistants' Union, No. 176	B. R. Humphrey	80 Emerald St., S., Hamilton	W. R. Berry	193 Market St., Hamilton	4th Friday.
Sheet Metal Workers' Union, No. 61	Thos. Hill	310 Hess St., S., Hamilton	Geo. E. Farr	20 Colborne St., Hamilton	1st and 3rd Friday.
International Alliance Theatrical Stage Employees, No. 129	Alf. Thompkins	37 Stuart St., E., Hamilton	G. Fitzpatrick	52 Spring St., Hamilton	4th Sunday.
Stonecutters' Association of N. America	Thos. Nixon	470 John St., W., Hamilton	Geo. Kayll	816 King St., E., Hamilton	2nd and 4th Thursday
Stove Mounters' International Union, No. 35	Wm. Keegan	67 Cheaver St., Hamilton	Thos. Buck	25 Tisdale St., Hamilton	1st Monday.
Street and Electric Railway Employees, No. 107	Geo. Gould	187 Lock St., N., Hamilton	C. E. Anderson	205 Ferguson Av., S., Hamilton	2nd and 4th Saturday.
Journeymen Tailors' Union of America, No. 149 (Custom)	Chas. Smith	300 Hunter St., W., Hamilton	H. J. Eickoff	234 Lock St., Hamilton	3rd Monday.
Order of Rail. Telegraphers, No. 155	W. H. Staniland	Grimsby P.O.	E. D. Armstrong	Box 98, Smithville, Ont.	2nd Sunday.
Tobacco Workers' Int. Union, No. 48	John Kelly	3 Richmond St., Hamilton	A. H. Bronghton	22 Hunt St., Hamilton	2nd and 4th Monday.
Brotherhood of Railway Trainmen, No. 226	H. J. Penton	81 Poulette St., Hamilton	R. L. Alwoes	22 Bailey St., Hamilton	2nd and last Sunday.
Typographical Union, No. 129	Geo. J. Campbell	Spectator Office, Hamilton	John J. Burns	90 Walnut St., S., Hamilton	2nd Wednesday.
Havelock:					
Order of Railway Conductors, No. 578	W. H. Jones	Havelock	J. Garratt	Box 47, Havelock	1st and 3rd Monday, 2 p.m.

Brotherhood of Locomotive Engineers, No. 658	Robt. Jack	Havelock	John Toman	Box 539, Havelock	2nd and 4th Monday, 1 p.m.
Brotherhood of Railway Trainmen, No. 293	J. E. Kelsey	Havelock	J. S. McWhorter	Smith's Falls, Ont.	2nd and 4th Thursday, 2.30 p.m.
Heron Bay:					
Maintenance of Way Employees, No. 231	J. Leawell	Heron Bay	A. Bianconi	Jack Fish, Ont.	Last Saturday.
Ingersoll:					
Brotherhood of Maintenance of Way Employees, No. 503	M. Sprague	Ingersoll	D. McCord	Belmont, Ont.	Call of President.
Kenora:					
Brotherhood of Ry. Carmen, No. 236	A. Kilpatrick	Kenora	T. J. Connett	24 First St., Kenora	3rd Friday.
Brotherhood of Locomotive Engineers, No. 535	J. D. Preston	Kenora	J. Penney	Kenora	1st Wednesday, 3rd Sunday.
International Association of Machinists, No. 28	T. McLellan	Box 151, Kenora	Jas. W. Douglas.	Box 151, Kenora	4th Monday.
Machinists' Helpers' Union, No. 12946	W. H. Tilley	Kenora	Thos. Turner	Box 199, Kenora	3rd Tuesday.
Brotherhood of Railway Trainmen, No. 270	Alf. McDonald	Kenora	J. Closkey	Box 109, Kenora	2nd and 4th Wednesday.
Kingston:					
Journeymen Barbers' International Union, No. 514	W. W. Haggarman	161 Princess St., Kingston	W. J. Lanman	377 King St., Kingston	Last Monday.
Bricklayers', Masons' and P. International Union, No. 1	Jas. Turner	Brock St., Kingston	Alex. Fowler	323 Johnston St., Kingston	2nd and 4th Tuesday.
International Building Labourers' Union, No. 66	Geo. Wilkinson	443 Alfred St., Kingston	Geo. White	214 William St., Kingston	1st and 3rd Wednesday.
United Brotherhood of Carpenters and Joiners, No. 249	Wm. Buck	Victoria St., Kingston	W. H. Hubble	26 Quebec St., Kingston	2nd and 4th Monday.
Letter Carriers' Union, No. 8	Robt. J. Elliott	Kingston P. O.	B. J. Hanlon	88 Division St., Kingston	When called.
Longshoremen's Union, No. 229	J. A. O'Neil	269 Sydenham St., Kingston	Wm. Payne	12 Ann St., Kingston	2nd and 4th Wednesday
National Association of Marine Engineers, No. 4	A. E. Kennedy	395 Johnston St., Kingston	Jas. Gillies	101 Clergy St., W., Kingston	Monday.
Masters' and Mates' Association	Capt. Erford	Division St., Kingston	Lt.-Col. Hunter	298 Collingwood St., Kingston	All aftns. in Winter.
International Moulders' Union No. 252	R. H. Murry	32 Patrick St., Kingston	Wm. E. Holland	26 Upper William St., Kingston	1st and 3rd Monday.
Brotherhood of Painters, Decorators, etc., No. 114	Wm. Veale	Nelson St., Kingston	W. T. Edgar	16 Rideau St., Kingston	1st and 3rd Monday.
Plumbers', etc., International Union, No. 221	M. LeBeuf	King St., Kingston	T. Blomely	67 Collingwood St., Kingston	1st and 3rd Tuesday.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
Kingston.—*Continued.*					
Ship Carpenters' and Caulkers' Union, No. 46	Jno. R. Marks, Sr.	Union St., Portsmouth.	M. J. Porter	Front St., Kingston	3rd and 4th Tuesday.
Journeymen Stonecutters' Association of N. America	Ch. McKinnon	368 Barrie St., Kingston	W. H. Jackson	110 Patrick St., Kingston	1st Tuesday.
Journeymen Tailors' Union, No. 263	Robt. Alexander.	451 Albert St., Kingston	J. Sauve	29 Brock St., Kingston	1st and 3rd Monday.
Typographical Union, No. 204	Jas. Bennett	Jackson Press, Kingston	W. Allan Stroud	376 Bagot St., Kingston	1st Tuesday.
Leamington:					
Brotherhood of Maintenance of Way Employees, No. 302	A. Allen	Leamington	Edwin Hodgson.	Leamington	No regular nights.
Lindsay:					
Order of Railway Conductors, No. 322	G. A. Garretson	Cedar Rapids, Iowa	W. J. Hodgson	Box 581, Lindsay	1st and 3rd Sunday.
Brotherhood of Locomotive Engineers, No. 174	W. G. Chambers.	Box 205, Lindsay	Thos. Wilkinson.	Box 205, Lindsay	2nd and 4th Sunday. 2 p.m.
Brotherhood of Locomotive Firemen and Enginemen, No. 136	Chas. Golden	Box 212, Lindsay	W. G. Graham	Box 212, Lindsay	1st and 3rd Sunday, 2.30 p.m.
Brotherhood of Railway Trainmen, No. 308	H. Debois	Box 528, Lindsay	D. Walker	Box 528, Lindsay	2nd and 4th Sunday.
London:					
Journeymen Barbers' International Union, No. 366	John Frezell	617 Dundas St., London	J. E. Secker	713 Richmond St., London	4th Monday.
Bartenders' International League, No. 137	Thos. Hall	City Hotel, London	H. G. Edsall	58 Colborne St., London	2nd and 4th Sunday.
International Association of Bill Posters, etc., No. 22	Wm. Cooney	Queen's Av., London	Ch. L. Vincent	673 Lorne Av. London	1st Sunday.
United Brewery Workmen, No. 381	Thos. Johnson	86 Chesley Av., London	Arthur Jackson	134 Mill St., London	2nd Thursday.
Bricklayers' and Masons' International Union, No 5.	Frank Tilbury	668 Lorne Av., London.	Frank C. Pierce.	687 Princess Av., London	2nd and 4th Wednesday.
Amalgamated Society of Carpenters and Joiners, No. 858	Walter Ellis	20 Alexander Street, London	John Tanton	379 Waterloo St., London	2nd and 4th Wednesday
United Brotherhood of Carpenters and Joiners, No. 1946	J. Cannon	952 Colborne St., London	J. S. Hill	687 Dundas St., London	2nd and 4th Friday.

Cigar Makers' International Union, No. 278	Wm. Everett	London	Wm. Heslop	93 Albion St., London.	1st and 3rd Tuesday.
Order of Railway Conductors No. 16	J. M. Riley	575 William St., London	H. J. Heath	Hyde Park, Ont.	1st and 3rd Sunday.
International Brotherhood of Electrical Workers, No. 120	Ernest Ingles	85 Clarence St., London	C. L. Thayer	185 Warncliffe Rd., W. London	2nd and 4th Thursday.
Amalgamated Society of Engineers, No. 709	Alex. McDonald	Oxford St., London	Geo. H. Scollick	585 Grey St., London	Alt. Fridays from June 21, 1912.
Brotherhood of Locomotive Engineers, No. 68	Jas. Porteous	374 York St., London	John Irwin	745 Dundas St., London	1st Sunday, 3rd Thursday.
Canadian Association of Stationary Enginemen, No. 30.	W. J. Paynter	22 Victor St., London.	D. F. Campbell	87 Elmwood St., London	2nd and 4th Fridays.
Brotherhood of Locomotive Firemen and Enginemen, No. 117	W. J. Richardson	14 Kitchener Av., London	W. McCall	379 Hamilton Rd., London	1st Wednesday, 3rd Sunday.
Brotherhood of Locomotive Firemen and Enginemen, No. 468	J. G. Sheppard	572 Oxford St., London	Chas. A. Phipps	830 Lorne Av., London	2nd and 4th Sundays 2.30 p.m.
United Garment Workers' of America, No. 33	Wm. Elliott	Emery St., London	L. Paladino	389 Burwell St., London	2nd Monday.
Granite Cutters' International Association			W. Cunningham	145 Clarence St., London	
Fed. Labour Union, No. 5	Wm. Cole	100 Cartwright St., London	Jos. T. Marks	425 Gray St., London	4th Friday.
Letter Carriers' Union, No. 4	Thos. F. Currie.	Dundas St., London	Wm. M. Empey	573 Oxford St., London	1st Wednesday.
Brotherhood of Maintenance of Way Employees, No. 2	D. Campbell	10 Thornton Av., London	D. H. Walsh	381 Central Av., London	Last Saturday.
Musicians' Association, No. 279	Harry Wooster	210 Wharncliffe Rd., London	C. N. Perrin	352 Adelaide St., London	4th Sunday.
Polishers, Buffers, etc., No. 32	D. H. Wright	378 Burwell St., London	J. Cummings	Chelsea Green P. O.	2nd and 4th Friday.
United Association of Plumbers, etc., No. 289	Jas. Mitchell	London	T. F. Avey	728 York St., London	2nd and 4th Monday.
Pressmen and Assistants' International Union, No. 173.	Chas. Hollins	270 Horton St., London	Chas. McArdell	111 Wellington Rd., London	1st Saturday.
International Alliance of Theatrical Stage Employees, No. 105	W. J. Burrows	225 Grey St., London	W. J. Stone	Grosvenor St., London.	1st and 3rd Sundays.
Journeymen Stonecutters' Association	Robt. Listen	726 Adelaide St., London	H. Boyd	875 Adelaide St., London	2nd and 4th Wednesday

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
London.—Continued.					
Order of Railway Telegraphers, No. 1	F. A. Parent	Casselman, Ont.	D. L. Shaw	867 Waterloo St., London	When called.
Order of Railway Telegraphers, No. 7	A. C. Chapman	265 Piccadilly St., London	G. T. Elliott	368 Dundas St., London	3rd Saturday.
Brotherhood of Railway Trainmen, No. 240	R. M. McLeod	187 Langath St., London	W. Harris	27 Victor St., London	1st and 3rd Sunday.
Brotherhood of Railway Trainmen, No. 415	Peter Kellsher	850 Pincess Av., London	W. H. Nichol	896 Princess Av., London	2.30 p.m.
Typographical Union, No. 133	E. J. Stein	340 Hamilton Rd., London	Wm. O. Ruse	120 Wilson Av., London	2nd and 4th Sunday.
Merritton:					1st Thursday.
United Brotherhood of Carpenters and Joiners, No 1,402	J. J. Fawell	Turner St., Merritton	Franklin Storm	Merritt St., Merritton	1st and 3rd Wednesday.
Midland:					
International Longshoremen's Association, No. 19	Geo. McMullen	Midland	D. A. Hall	Midland	1st and 3rd Tuesday.
Milverton:					
Maintenance of Way Employees, No. 163.	T. A. Nettleship	Monkton, Ont.	Jas. J. Elliott	Milverton	1st Friday, Jan., April, July, October.
Niagara Falls:					
Amalgamated Society of Carpenters and Joiners, No. 793	C. Reid	125 Ryerson Ave., Niagara Falls	N. Bromhall	45 McGrail Ave., Niagara Falls	Alternate Fridays from April 19.
United Brotherhood of Carpenters and Joiners, No. 713	R. O. Blayney	245 River Rd., Niagara Falls	Walt. Harwood	145 Ryerson Ave., Niagara Falls	Every Wednesday.
International Union of Steam Engineers, No. 232	J. A. McPherson	Alexander House, Niagara Falls Centre	Chas. Hansel	8 Queen St., Niagara Falls	2nd and 4th Friday.
United Hatters of North America, No. 20	F. M. Zeigler	Bridge St., Niagara Falls	J. B. Tyler	22 Bridge St., Niagara Falls	1st Monday, Jan., April, July, October.
Federated Association of Letter Carriers, No. 36	Lorne Robinson	72 Ross St., Niagara Falls	H. H. Smith	164 Ontario Ave., Niagara Falls	1st Tuesday.
Journeymen Stone Cutters' Association	John Madden	Stamford, Ont.	E. Garnell	62 Morrison St., Niagara Falls	4th Monday.
Brotherhood of Railway Trainmen, No. 379	Jas. Collins	Bridge St., Niagara Falls	F. C. Ortt	Ellis St., Niagara Falls	2nd and 4th Friday.

North Bay:					
International Brotherhood of Blacksmiths, etc., No. 474	Robt. Forsyth	North Bay	Napoleon Turgeon	Box 798, North Bay	Last Saturday.
Brotherhood of Railway Carmen, No. 192	Westly Soule	North Bay	H. Freeman	Box 490, North Bay	4th Friday.
Order of Railway Conductors, No. 242	J. P. Murray	Worthington St., North Bay	Alex. Brown	Box 161, North Bay	2nd and 4th Monday, 2 p.m.
Order of Locomotive Engineers, No. 308	Wm. Hallandal	North Bay	Thos. W. Turner	183 McIntyre St. W., North Bay	1st and 3rd Monday, 2.30 p.m.
Brotherhood of Maintenance of Way Employees, No. 244	A. E. Gartnohek	Warren, Ont.	D. C. Wilson	Mattawa, Ont.	Last Saturday.
Brotherhood of Railway Trainmen, No. 249	R. H. Dingwell	North Bay	A. Couchy	North Bay	
Orangeville:					
Maintenance of Way Employees, No. 214	R. B. McIntosh	374 Fourteenth St. E., Owen Sound	D. McDougall	Box 388, Fergus, Ont.	Last Saturday March, June, Sept., Dec.
Oshawa:					
International Moulders' Union, No. 136	Archie Robinson	Oshawa	R. H. Rogan	Box 144, Oshawa	3rd Thursday.
Pattern Makers' League of North America	Norman Stewart	Centre St., Oshawa	John Butchart	217 Albert St., Oshawa.	1st and 3rd Thursday.
Ottawa:					
International Brewery Workers' Union, No. 365	Aug. Schraeder	134 McKay St., Ottawa.	Harry J. Levesque.	64 Laurier Ave. E., Ottawa	2nd and 4th Tuesday.
Bricklayers' International Union, No. 7	Samuel Moore	5 Henry St., Ottawa	Alex. Findlay, jr.	313 Sunnyside Ave., Ottawa	2nd Monday.
Building Labourers' International Union, No. 4	Thos. Squerrell	234 Bay St., Ottawa	Geo. Williams	Britannia Bay P.O.	2nd and 4th Monday.
Brotherhood of Carpenters and Joiners, No. 93	Louis Blouin	145 Breezehill Ave., Ottawa	Emery Belair	267 Clarence St., Ottawa	2nd and 4th Tuesday.
Order of Railway Conductors No. 29	T. B. Lamplough.	85 Kent St., Ottawa	J. B. Morris	308 Bronson Ave., Ottawa	2nd and 4th Sunday.
Brotherhood of Locomotive Engineers, No. 168	John Wilson	70 Elm St., Ottawa	J. P. Chisholm	652 Wellington St., Ottawa	2nd and 4th Sunday.
Brotherhood of Locomotive Firemen and Enginemen No. 172	Holland E. White.	15 Spadina Ave., Ottawa	Thos. A. Smyth	59 Spadina Ave., Ottawa	2nd and 4th Friday.
Federated Labour Union, No. 9	John McKibbons.	500 McLeod St., Ottawa.	Robt. Lamb	300 McKay St., Ottawa.	Tuesdays & Thursdays.
Lathers' International Union, No. 60	Marrima Dagenais	113 Nicholas St., Ottawa	Francis Fortin	Gatineau Point	Wednesdays.
International Association of Machinists, No. 412	Ernest Neumon	65 Anderson St., Ottawa	Jos. W. Vincent	59 Concord St., Ottawa	2nd and 4th Friday.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
Ottawa.—*Con.*					
International Moulders' Union, No. 280	Jas. Fagan	527 McLeod St., Ottawa	J. Edgar Bedard	155 Alma St., Hull, Que	1st and 3rd Thursday.
Brotherhood of Painters and Decorators, No. 200	Harry Herbet	47 Turner St., Ottawa.	E. C. Brandt	57 Bayswater Ave., Ottawa	1st and 3rd Wednesday.
International Brotherhood of Paper Makers, No. 34	Morton Hutchinson	3 Bell St., Ottawa	L. W. Casselman	100 Preston St., Ottawa	1st and 3rd Sunday.
Operative Plasterers' International Association, No. 124	Thos. H. Jarvis	18 Fourth Ave., Ottawa	John Herdman	183 Creighton St., Ottawa	1st and 3rd Tuesday.
Plasterers' Labourers' Union, No. 1	A. Bethell	Westboro P.O.	C. Alexander	Cummings Bridge P.O.	2nd and 4th Thursday.
Press Feeders' and Assistants' Union, No. 9	J. J. Rooney	711 King Edward Ave., Ottawa	Orp Bureau	289 St Andrews St., Ottawa	2nd Monday.
Printing Pressmen's Union, No. 5	Warren E. Bell	9 Salisbury Pl., Ottawa	Alf. J. Landen	327 Bell St., Ottawa	3rd Friday.
Sheet Metal Workers' Union, No. 47	Israel Sauve	102 Queen St., Ottawa.	Wm. White	119 Spruce St., Ottawa.	1st and 3rd Thursday.
International Alliance of Theatrical Stage Employees, No. 95	Harry H. Haig	358 Albert St., Ottawa.	Donald J. Casey	52 Gloucester St., Ottawa	1st Sunday.
International Union of Steam Engineers, No. 473	Chas. Lewis	21 Garland St., Ottawa.	J. Lake	267 Preston St., Ottawa	2nd and 4th Wednesday
Steel and Copper Plate Printers, No. 6	Wm. H. Kent	969 Wellington St., Ottawa	Edward J. Lane.	127 Osgoode St., Ottawa	1st Wednesday.
Stereotypers' Union, No. 50	Thos. Miller	27 Clegg St., Ottawa E	Chas. Coulter	103 Main St., Ottawa E.	Saturdays.
Journeymen Stonecutters of North America	W. E. Turner	Riverside Park, Ottawa West	Geo. Birnie	195 Gladstone Ave., Ottawa	2nd and 4th Friday.
Stonemasons' Union, No. 14	John Cameron	265 Parkdale Ave., Ottawa	M. Fleury	214 Patterson Ave., Ottawa	Alternate Mondays.
Brotherhood of Railway Trainmen, No. 129	A. E. Salmon	3 Elm St., Ottawa	T. E. Burgess	103 Spadina Ave., Ottawa	1st and 3rd Sundays, 2.15 p.m.
Brotherhood of Railway Trainmen, No. 185	John Maloney	52 Henderson Ave., Ottawa	H. H. Brown	540 Lyon St., Ottawa	Alternate Sundays 2 p.m.

Typographical International Union, No. 102	P. M. Draper	112 Florence St., Ottawa	A. E. Sheppard	Box 491, Ottawa	1st Saturday.
Canadian Typographical Union, No. 1	Chas. G. Pepper	239 Frank St., Ottawa.	F. J. Guthaas	196 Stanley Ave., Ottawa	2nd Saturday.
Owen Sound:					
Canadian Association of Steam Engineers, No. 25	J. Hovey	1524 Fifth Ave. West, Owen Sound	W. J. Needham	2099 Third Ave. East, Owen Sound	Every Thursday.
International Moulders' Union, No. 413	Sam. French	1569 Seventh Ave. East, Owen Sound	Wm. O. Cornwith	1673 Fourth Ave. West, Owen Sound	1st and 3rd Tuesday
Journeymen Stonecutters' Association of North America.	Geo. A. Perkins	820 Sixth Ave. West, Owen Sound	Edw. Gaskell	1132 Fourth Ave. East, Owen Sound	1st and 3rd Friday.
Palmerston:					
Order of Railway Conductors, No. 492	A. B. Garretson	Cedar Rapids, Iowa	D. A. Cox	Box 59, Palmerston	2nd Sunday.
Brotherhood of Locomotive Firemen and Enginemen, No. 181	J. Mogk	Palmerston	Thos. Lee	Box 115, Palmerston	1st and 3rd Sunday.
Parry Sound:					
International Association of Machinists, No. 518	Leslie Nason	Parry Sound	Jos. Smith	Box 423, Parry Sound	1st and 3rd Wednesday.
Maintenance of Way Employees, No. 447	J. Darling	Shawanaga P. O.	C. Smith	Otter Lake Station	No regular date.
Brotherhood of Railway Trainmen, No. 759	W. Burke	34 Northumberland Ave., Toronto	S. G. Wilkinson	Box 535, Parry Sound	2nd and 4th Sunday. 2 p.m.
Pembroke:					
Maintenance of Way Employees, No. 221	J. Murphy	Pembroke	A. Austin	Pembroke	
Peterborough:					
International Brewery Workers' Union, No. 304	Robt. Lingard	116 Sophia St. East, Peterborough	John C. Godfrey	Downers Corners P.O.	1st Tuesday.
Bricklayers', Masons' and Plasterers' Union, No. 17	Thos. J. Marks	539 Reid St., Peterboro.	Wm. Stevens	Box 778, Peterboro	1st and 3rd Tuesday.
United Brotherhood of Carpenters and Joiners, No. 672	Thos. Ephgrave	610 Union St., Peterborough	Geo. Sloan	518 Chamberlain St., Peterboro	2nd and 4th Monday.
Carpet Weavers' Association, No. 663	Emmitt Stansfield	4 Lansdowne St., Peterboro	Thos. Dark	Claraday P.O.	3rd Monday.
Federated Association of Letter Carriers, No. 22	T. J. Edwards	491 College St., Peterboro	Robt. Reid	90 Auburn St., Peterboro	1st Wednesday.
International Association of Machinists, No. 286	Mal'm McConomy	Peterboro	Geo. Stenton	Peterboro P.O.	4th Monday.
Maintenance of Way Employees, No. 211	Geo. Spicer	Peterboro	Geo. A. Timmons	Leaside	Call of President.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
Peterborough.—*Continued.*					
International Moulders' Union, No. 191	Hugh Robertson..	567 Reid St., Peterboro.	W. A. Mowry.....	457 Cedar St., Peterboro	1st and 3rd Thursday.
Pattern Makers' League of North America	C. F. Browne.....	College St., Peterboro..	J. A. Sharp.....	537 Homewood Ave., Peterboro	2nd and 4th Thursday.
Journeymen Tailors' Union of America, No. 23.....	C. Strimas	King George Hotel, Simcoe St.	G. A. McGee.....	516 Water St., Peterboro	Every 4th Tuesday.
Typographical Union, No. 248.	Jas. T. Dillon.....	303 Marks St., Peterboro	J. M. Galbraith....	125 Brock St., Peterboro	1st Saturday.
Porcupine:					
Western Federation of Miners, No. 145	Jas. Dogue	Box 521, South Porcupine	Jas. D. Cluney.....	Box 521, South Porcupine	Sunday afternoon.
Port Arthur:					
Bartenders' International League, No. 757	J. H. Walker.....	Vendome Hotel, Port Arthur	L. Berringer.....	Union Hotel, Pt. Arthur	1st and 3rd Sunday.
Amalgamated Society of Carpenters and Joiners, No. 865	Percy Manning....	42 Ontario St., Port Arthur	W. D. Mantle.....	176 Banning St., Pt. Arthur	2nd and 4th Monday.
United Brotherhood of Carpenters and Joiners, No. 285	W. Robertson.....	91 Crown St., Pt. Arthur	R. L. Srigley....	255 College St., Pt. Arthur	1st and 3rd Monday.
Electrical Workers' Union, No. 367	Alex. McCrae.....	Western Hotel, Pt. Arthur	Chas. Lambert....	125 Algoma St., Pt. Arthur	2nd and 4th Wednesday
Canadian Association of Stationary Engineers, No. 29..	John Insley	370 Dufferin St., Port Arthur	Sam. Smith	506 Van Norman St., Pt. Arthur	1st and 3rd Friday.
Federated Labour Union, No. 14,155	Herbert Barker...	157 Pine St., Pt. Arthur	Arch. Logan	68 Burns St., Pt. Arthur	1st and 3rd Friday.
International Longshoremen's Association, No. 319 (Coal Handlers)	M. Pents	337 Ambrose St., Pt. Arthur	Geo. Ross	600 McIntosh St., Pt. Arthur	1st and 3rd Sunday.
International Association of Machinists, No. 820	Robt. Christie....	270 Algoma St., Pt. Arthur	Andrew Boyd ..	368 Wiley St., Pt. Arthur	3rd Tuesday.
Plumbers', Steamfitters', etc., Union, No. 378	Geo. Bell	54 Machar Ave., Pt. Arthur	Wm. Davie	Elm St., Pt. Arthur ...	2nd and 4th Friday.
Journeymen Stonecutters' Association of North America	Mike King	Algonquin Ave., Pt. Arthur	Robt. Paton	Empire Ave., Pt. Arthur	2nd and 4th Tuesday.
Typographical Union, No. 575.	H. E. Lawrence...	Centre St., Pt. Arthur..	T. Hy. Wynn.....	501 Van Norman St., Pt. Arthur	2nd Tuesday.

Preston:					
International Moulders' Union, No. 314	John Doyle	Preston	T. J. Parker	Box 85, Preston	1st and 3rd Wednesday
Polishers', Buffers', etc., Union, No. 27	Archie Wright	Preston	F. A. Schartzberg	Box 374, Preston	3rd Tuesday.
Stove Mounters' International Union, No. 11	Frank Henning	Preston	John A. Tobin	Preston	1st and 3rd Friday.
Rainy River:					
Brotherhood of Railway Carmen, No. 436	W. F. Crackle	Rainy River	B. Franks	Rainy River	20th of month.
Order of Railway Conductors, No. 30	A. B. Garettson	Cedar Rapids, Iowa	S. McElroy	Box 24, Rainy River	1st and 3rd Sundays, 4.30.
Brotherhood of Locomotive Firemen and Enginemen, No. 750	A. L. Campbell	Box 152, Rainy River	Wm. Douglas	Box 189, Rainy River	2nd and 4th Tuesday.
Richmond Hill:					
Order of Railway Telegraphers	H. B. Perham	Star Bldg., St. Louis, Mo.	G. Fisk	300 Montrose Ave.	Call of chair.
St. Catherines:					
Barbers' International Union, No. 1	Harry Stutt	St. Paul St., St. Catharines	A. M. Thayner	293 St. Paul's St., St. Catharines	1st and 3rd Monday.
Brewery Workers' International Union, No. 305	Geo. Wiley	Cherry St., St. Catharines	Robt. Hall	4 Thomas St., St. Catharines	3rd Friday.
Bricklayers', Masons' and Plasterers' International Union, No. 4	J. A. Rowder	11 Raymond St., St. Catharines	C. G. Patey	48 Louise St., St. Catharines	1st and 3rd Tuesday.
Amalgamated Society of Carpenters and Joiners, No. 867	W. H. C. Nicholas	19 Wiley St., St. Catharines	Jas. Atkinson	41 Elizabeth St., St. Catharines	Alternate Thursdays.
United Brotherhood of Carpenters and Joiners, No. 38	John B. Dunklee	35 George St., St. Catharines	Jas. Carty	19 Cherry St., St. Catharines	Every Friday.
Cigar Makers' International Union, No. 140	Wilfrid Haynes	13½ Cherry St., St. Catharines	Leo. T. Coyle	3 Court St., St. Catharines	1st Saturday.
Federated Association of Letter Carriers, No. 17	Reginald Gore	208 Niagara St., St. Catharines	F. S. Whitten	65 Ontario St., St. Catharines	Last Friday.
International Association of Machinists, No. 268	Frank Lynox	17 Elizabeth St., St. Catharines	J. A. Rothwell	58 Lake St., St. Catharines	2nd Monday.
International Moulders' Union, No. 385	Harry Grey	47 Queenston St., St. Catharines	Fred. Keene	39 Albert St., St. Catharines	2nd and 4th Friday.
Brotherhood of Painters, Decorators, etc., No. 407	E. A. Day	George St., St. Catharines	Wm. D. Outram	30 Nelson St., St. Catharines	2nd and 4th Wednesday
Plumbers' and Steamfitters' Union, No. 244	B. A. Price	61 George St., St. Catharines	Harry Oliver	31 Beith St., St. Catharines	Every Thursday.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
St. Catharines.—*Continued.*					
Polishers', Buffers', etc., No. 97	Lorne Tufford	29 Catharine St., St. Catharines	Wm. Bowen	29 Henry St., St. Catharines	
Journeymen Tailors' Union, No. 235	F. J. Coyl	Grand Central Hotel, St. Catharines	V. Fullerton	90½ King St., St. Catharines	1st and 3rd Friday.
Typographical Union, No. 416	W. J. Thompson	Standard Office, St. Catharines	D. Marshall	33 Henry St., St. Catharines	1st Monday.
St. Mary's:					
Journeymen Stonecutters' Association	Alex. Craig	St. Mary's P.O.	Wm. H. McCauley	St. Mary's P.O.	Last Monday.
					No set date.
St. Thomas:					
Boiler Makers' International Brotherhood, No. 413	Cornelius Doxey	St. Thomas	W. McGillivray	20 Hemlock St., St. Thomas	2nd and 4th Tuesdays.
Brotherhood of Boiler Makers' Helpers, No. 5	Ernest May	30 Maple St., St. Thomas	F. Dunworth	30 Maple St., St. Thomas	1st and 3rd Wednesdays
Bricklayers' and Masons' Union, No. 8	Chas. Heard	35 Hincks St., St. Thomas	Orlando Beal	83 Erie St., St. Thomas	2nd and 4th Wednesdays
Cigar Makers' International Union, No. 420	G. Haslain	Curtis St., St. Thomas.	Fred. Roberts	4 Balfour St., St. Thomas	1st Friday night, 3rd Saturday afternoon.
Order of Railway Conductors No. 13	Ed. Adderman	124 Centre Street, St. Thomas	F. Hastings	48 Southwick St., St. Thomas	2nd and 4th Sundays, 2 p.m.
Brotherhood of Locomotive Engineers, No. 529	John McGregor	23 Yardwood St., St. Thomas	A. H. Martin	52 Manitoba St., St. Thomas	Every Tuesday, 2 p.m.
Brotherhood of Locomotive Engineers, No. 661	Chas. L. Wilson	53 Southwick St., St. Thomas	H. H. Buckpitt	45 Mitchell St., St. Thomas	Wednesdays, 2 p.m.
Amalgamated Society of Engineers, No. 713	Rich. Edleston	1 Smith Avenue, St. Thomas	Wm. Young	36 Arthur Ave., St. Thomas	Fortnightly.
Brotherhood of Locomotive Firemen and Enginemen, No. 5	Jas. T. O'Dell	110 Forest Avenue St. Thomas	W. W. Scott	24 Maple St., St. Thomas	Friday, 2 p.m.
Gas Workers' Union of Federated Labour, 13,144	C. Boxall	St. Thomas	Wm. Stokes	69 Flora St., St. Thomas	1st Wednesday.
International Association of Machinists, No. 294	Archie Vicary	Dake House, St. Thomas	J. J. I. Stewart	56 Redan St., St. Thomas	1st and 3rd Tuesdays.

Machinists' Helpers, etc., No. 12,906	Jas. Wilson	Barnes St., St. Thomas	Frank Teetzel	32 Chester St., St. Thomas	1st and 3rd Mondays.
Brotherhood of Maintenance of Way Employees	.....	.....	.....	.....	2nd and 4th Thursdays.
International Association of Pipe Fitters and Helpers, No. 107	Chas. M. Doritty	8 Maple St., St. Thomas	A. G. Stacey	90 Forest Ave., St. Thomas	1st and 3rd Wednesdays
International Union of Printing Pressmen, etc., No. 129	H. Colledge	St. Thomas	Fred. Hardy	35 Alexandra Ave., St. Thomas	2nd Monday.
Brotherhood of Railway Signalmen of America	W. L. Fallis	44 Erie St., St. Thomas	L. Hoover	Ridgetown, Ont.	1st Thursday after 10th
Journeymen Tailors' Union of America, No. 141	Frank Garrow	Jackson St., St. Thomas	Wm. Abernethy	30 Ross St., St. Thomas	4th Monday.
Brotherhood of Railway Trainmen, No. 47	A. E. Hookway	638 Talbot St., St. Thomas	H. Sharp	2 John St., St. Thomas	Every Monday.
Typographical Union, No. 459	Chas. Reid	Hamilton Street, St. Thomas	Robt. Porter	8 Drake St., St. Thomas	2nd Monday.
Sarnia:					
Journeymen Barbers' International Union, No. 467	Murray Jaynes	143 Front St., Sarnia	Wm. Knight	140 Cromwell St., Sarnia	1st Tuesday.
Bricklayers', Masons' and Plasterers' International Union, No. 23	Henry Walton	Cromwell St., Sarnia	R. B. Murray	119 N. Milton St., Sarnia	1st and 3rd Mondays.
Brotherhood of Railway Carmen, No. 295	Donald Campbell	321 Russell St., Sarnia	A. Baker	401 George St., Sarnia.	Last Monday.
Order of Railway Conductors, No. 189	John W. Weston	127 Vidal St., Sarnia	H. Bell	288 Campbell St., Sarnia	1st and 3rd Tuesdays, 7.30 p.m.
Brotherhood of Locomotive Engineers, No. 240	Henry Steel	Shepherd St., Sarnia	Jas. Copeland	140 Savoy St., Sarnia	Alt. Thursdays.
Brotherhood of Locomotive Firemen and Enginemen, No. 221	Geo. W. Harris	258 S. Brock St., Sarnia	H. J. Sitterley	442 Confederation St., Sarnia	1st and 3rd Tuesdays.
Federated Association of Letter Carriers, No. 31	Chas. Duncan	Sarnia	A. A. Bowles	144 N. Euphemia St., Sarnia	None.
International Longshoremen's Association, No. 253	Dav. Harrison	246 River St., Sarnia	Benj. Shultes	246 River St., Sarnia	1st and 3rd Fridays.
Brotherhood of Railway Trainmen, No. 227	W. W. Melick	Wellington St., Sarnia.	D. McEachan	125 Margaret St., Sarnia	1st and 3rd Mondays.
Sault Ste. Marie:					
Amalgamated Society of Carpenters and Joiners, No. 869	E. D. Gittam	Box 377, Sault Ste. Marie	J. Breeze	Box 777, Sault Ste. Marie	1st and 3rd Mondays.
Lathers' International Union, No. 191	John Bullock	49 Borron Ave., Tim Hill	John W. Bullock.	49 Borron Ave., Tim Hill	1st Friday.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address.	Name of Secretary.	Secretary's Address.	Night of Meeting.
Sault Ste. Marie.—*Continued.*					
Brotherhood of Locomotive Firemen and Enginemen, No. 606	J. B. Reilly	508 Wellington St., Sault Ste. Marie	T. J. Ralph	Church St., Sault Ste. Marie	2nd Wednesday.
Brotherhood of Maintenance of Way Employees, No. 269	W. Warmeley	Echo Bay, Ont.	W. Jewkes	269 Bruce St., Sault Ste. Marie	Last Saturday.
International Moulders' Union, No. 391	Jas. Darrance	Bruce Hill, Sault Ste. Marie	E. Spence	150 Murray St., Sault Ste. Marie	3rd Friday.
Plumbers' and Steamfitters' Union, No. 414	Hugh Polson	June St., Sault Ste. Marie	J. S. Dew	131 Tybourne Ave., Sault Ste. Marie	2nd and 4th Thursdays.
Schreiber:					
Brotherhood of Locomotive Firemen and Enginemen, No. 387	Wm. Hughes	Box 12, Schreiber	E. E. Cambridge	Box 173, Schreiber	1st Sunday, 2 p.m., 3rd Wednesday, 8 p.m.
International Association of Machinists, No. 69	Wm. Lister	Schreiber	Frank Castner	Falina St., Schreiber	2nd and 4th Thursdays.
Brotherhood of Maintenance of Way Employees, No. 260	C. Erickson	Schreiber	W. Sparkes	Schreiber	Last Sunday.
Silver Centre:					
Western Federation of Miners, No. 148	H. J. Murphy	Silver Centre	Jos. E. Redmond	Silver Centre	Sundays, 2 p.m.
Simcoe:					
Maintenance of Way Employees, No. 217	A. B. Lowe	Olive St., St. Louis, Mo.	R. Tredwell	Midhurst, Ont.	Every three months.
Smith's Falls:					
Bricklayers', Masons' and Plasterers Union, No. 21	J. W. Perry	Smith's Falls	Adam Johnston	Box 231, Smith's Falls	2nd and 4th Wednesday.
Brotherhood of Locomotive Engineers, No. 381	A. G. Boyd	Winnifrid St., Smith's Falls	Geo. T. McGlaughlin	McGill St., Smith's Falls	1st and 3rd Tuesday, 1.30 p.m.
Brotherhood of Maintenance of Way Employees, No. 136	Frank Bragg	Avonmore, Ont.	A. Seal	Box 64, Finch, Ont.	Call of President.
International Moulders' Union, No. 201	Wm. Ferguson	Smith's Falls	Geo. Elliott	Box 263, Smith's Falls.	1st and 3rd Tuesday.

Stevensville:					
Order of Railway Telegraphers (Division No. 16)	J. C. Culkins	Albion, Mich.	J. H. Staling	Stevensville	3rd Monday.
Stratford:					
Journeymen Barbers' International Union, No. 136	W. T. Nelson	Albert St., Stratford	G. J. Spriggs	273 Ontario St., Stratford	
Boiler Makers', etc., Union, No. 297	D. Hishon	28 Argyle St., Stratford	W. J. Pepper	78 Inverness St., Stratford	Last Monday.
Bricklayers', Masons' and Plasterers' Union, No. 24	A. G. Everett	Chestnut St., Stratford.	W. L. Lewis	107 Milton St., Stratford	1st and 3rd Friday.
Cigar Makers' Union, No. 424.	M. E. Whalen	Church St., Stratford	Jas. Hagarty	179 St. David St., Stratford	2nd and 4th Thursday.
Order of Railway Conductors, No. 15	D. McHaffie	231 Ontario st., Stratford	R. T. Buchanan.	37 Milton St., Stratford	First Wednesday.
Brotherhood of Locomotive Engineers, No. 188	Wm. A. Browne	141 Douro St., Stratford	J. Banting	185 Douro St., Stratford	2nd and 4th Sunday.
Amalgamated Society of Engineers, No. 579	Hugh Dickie	Burford St., Stratford	Wm. Bell	216 Douro St., Stratford	1st and 3rd Sunday. 2.30 p.m.
Brotherhood of Locomotive Firemen and Enginemen, No. 38	John J. Camp	145 Rebecca St., Stratford	John F. Spencer.	93 Nile St., Stratford	Every 2nd Saturday.
International Association of Machinists, No. 103	Robt. Haines	235 Nelson St., Stratford	Ernest Etherington	297 Erie St., Stratford.	2nd and 4th Sunday, 2.30 p.m.
Brotherhood of Railway Trainmen, No. 8	T. N. Northcott	Perth St., Stratford	M. T. Fox	19 Strachan St., Stratford	2nd and 4th Monday.
Typographical Union, No. 139.	H. C. Miller	75 Downie St., Stratford	Roy H. Dunbar	195 Brunswick Street, Stratford	1st Sunday, 3rd Tuesday.
Sudbury:					1st Saturday.
Bartenders' International League, No. 237	Aurel Gatien	Sudbury	Edward Charron.	Sudbury	2nd Monday.
Amalgamated Society of Carpenters and Joiners, No. 9	Jas. Linklater	Sudbury	W. Clarke	Box 643, Sudbury	Alt. Fridays.
Journeymen Tailors' Union, No. 226	J. P. O'Bryne	Box 150, Sudbury	W. Sangster	Box 150, Sudbury	2nd Monday.
Thorold:					
United Brotherhood of Carpenters and Joiners, No. 1,677	Wm. McMillen	Thorold	Frank Parmenter	Box 224, Thorold	3rd Thursday.
Toronto:					
Journeymen Barbers' International Union, No. 517	Geo. E. Wright	1606 Dundas St., Toronto	Jas. Tennyson	118 Shuter St., Toronto	4th Thursday.
Bartenders' Union and Benefit Society, No. 280	Archie Cameron.	Elliott House, Toronto.	A. O'Leary	248 Havelock St., Toronto	4th Sunday.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
Toronto.—*Con.*					
International Union of Bill-posters, etc., No. 40	Robt. Harrington	Toronto	W. Gimblett	15 Temperance St., Toronto	2nd Sunday.
Brotherhood of Boiler Makers, etc., of Canada, No. 1	Jas. Higgins	573 Perth Ave., Toronto	A. E. Potter	1201 Dufferin St., Toronto	2nd and 4th Friday.
International Boiler Makers, etc., No. 548	Chas. Young	169 Mulock Ave., Toronto	W. W. Watson	37 Jerome St., Toronto	1st and 3rd Friday.
International Brotherhood of Bookbinders, etc., No. 28	Geo. T. Hull	37 Myrtle Ave., Toronto	C. R. Hurst	363 Roxton Rd., Toronto	2nd Monday.
Boot and Shoe Workers' International Union, No. 233	John Duncan	46 Markham St., Toronto	P. M. Waterfield.	66 Bartlett Av., Toronto	Every Monday.
International Union of Brewery Workers, No. 317 (Maltsters)	Jas. Dowling	33 Sackville St., Toronto	Alf. Cheeseman.	62 Greenwood Av., Toronto	2nd and 4th Thursday.
Bricklayers' Union, No. 2	D. S. McCurdy	104 Conduit St., Toronto	R. A. Watson	272 Sackville St., Toronto	Tuesdays.
Bricklayers etc., Union., No. 26 (Stonemasons)	J. E. Booth	84 McGill St., Toronto.	A. Robb	901 Shaw St., Toronto	1st and 3rd Thursday.
Bridge and Structural Iron Workers, No. 4	Wm. Joyce	9 Northcote Ave., Toronto	R. Banks	218 Logan Av., Toronto	1st and 3rd Tuesday.
International Broom and Whisk Makers, No. 55	Wm. Kierstead	Deer Park, P.O.	Chas. Christopher	230 Heath St., Toronto	2nd and 4th Thursday.
Builders' Labourers' Union, No. 1	G. Drover	35 Wyndham St., Toronto	J. Kirby	19 Belshaw Av., Toronto	Every Tuesday.
Brotherhood of Railway Carmen, No. 258	J. E. McEwan	94 Prescott Ave., Toronto	J. W. Brickley	Mount Dennis P. O.	3rd Wednesday.
Amalgamated Society of Carpenters and Joiners, 1st Branch, No. 798	J. E. Walker	40 Greenwood Ave., Toronto	Arthur Barker	Bertha St., Swansea, Ont.	2nd Monday from Jan 8th.
Amalgamated Society of Carpenters and Joiners, 2nd Branch, No. 873	C. S. Bottomley	306 Bathurst St., Toronto	Chas. Fraser	24 Grove Av., Toronto.	Alt. Monday from Jan 1st.
Amalgamated Society of Carpenters and Joiners, 3rd Branch, No. 874	J. B. Johnson	191 Emerson Ave., Toronto	Geo. Thomson	223 Lippincott St., Toronto	2nd and 4th Wednesday

Amalgamated Society of Carpenters and Joiners, 4th Branch, No. 801	A. W. Turner	97 University Ave., Toronto	A. J. Udall	26 Howie Av., Toronto	Fortnightly from Jan. 1st.
Amalgamated Society of Carpenters and Joiners, 5th Branch, No. 802	H. Tooke	39 Balmuto St., Toronto	Wm. V. Burrow	319 Jones Av., Toronto	2nd Tuesday.
Amalgamated Society of Carpenters and Joiners, 6th Branch, No. 877	R. Gidlow	Natalie St., Toronto	T. Gazey	114 Chester Av., Toronto	2nd and 4th Tuesday.
United Brotherhood of Carpenters and Joiners, No. 27	Chas. Moad	638 Brock Ave., Toronto	Thos. McDonald	14 Hazelwood Av., Toronto	Every Tuesday.
United Brotherhood of Carpenters and Joiners, No. 1,553	T. A. Grover	200 Roehampton Ave., Toronto	Henry Gist	217 Merton St., Toronto	1st and 3rd Friday.
United Brotherhood of Carpenters and Joiners, No. 1,799.	Gerald Baines	22 Buchanan St., Toronto	Alex. Suttie	9 Charles St. E., Toronto	Every Thursday.
United Brotherhood of Carpenters and Joiners, No. 1,820 (Cabinet Makers, etc.)	Arch. Carmichael	67 Tiverton Ave., Toronto	Tennison Jackson	67 Tiverton Av., Toronto	Every Tuesday.
Carriage, Wagon and Auto Workers, No. 85	John McDoland	59 River St., Toronto	H. Gain	344 Clinton St., Toronto	1st and 3rd Wednesday.
Cigar Makers' International Union, No. 27	J. McCarthy	118 Manning Ave., Toronto	J. Pamphilon	88 Church St., Toronto	3rd Monday.
Order of Railway Conductors, No. 17	Chas. Stewart	Rose Hill Ave., Toronto	A. Riley	706 Markham St., Toronto	1st and 3rd Sunday.
Order of Railway Conductors, No. 345	A. B. Garretson	Cedar Rapids, Iowa	G. A. Wood	61 Empress Crescent, Toronto	2nd and 4th Sunday, 2.30 p.m.
International Brotherhood of Electrical Workers, No. 114	H. G. Allen	122 Paton Rd., Toronto	J. D. Hagerman	952 Shaw St., Toronto	2nd and 4th Thursday.
International Brotherhood of Electrical Workers, No. 353 (Linemen)	A. Irwin	38 Endean Ave., Toronto	W. F. Robinson	103 Bolton Av., Toronto	1st and 3rd Wednesday.
Amalgamated Society of Engineers, No. 689	W. M. Forbes	296 Bartlett Ave., Toronto	John M. Clements	650 Shaw St., Toronto	Alt. Monday.
Hoisting and Portable Engineers, No. 356	Rich. Banks	215 Logan Ave., Toronto	L. M. Putman	122 Augusta Av., Toronto	1st and 3rd Wednesday.
Brotherhood of Locomotive Engineers, No. 70	Wm. Newcombe	490 Markham St., Toronto	I. Belyea	1002 Bathurst St., Toronto	2nd and 4th Sunday.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address.	Name of Secretary.	Secrtary's Address.	Nights of Meeting.
Toronto.—*Con.*					
Brotherhood of Locomotive Engineers, No. 295	A. W. Scruton	64 McKenzie Crescent, Toronto	W. B. Carruthers.	73 Lawe St., W. Toronto	1st Sunday and 3rd Monday, 1.30 p.m.
International Union of Steam Engineers, No. 152	Chas. Powers	437 Pape Ave., Toronto.	Robt. Shepherd	210 Berkeley St., Toronto	2nd and 4th Wednesday.
Brotherhood of Locomotive Firemen and Enginemen, No. 67	Geo. E. Crowhurst	90 Wolseley St., Toronto	Jas. Pratt	218 Fern Av., Toronto.	1st Thursday, 3rd Sunday.
Brotherhood of Locomotive Firemen and Enginemen, No. 262	Geo. H. Smith	1031 Keele St., West Toronto	W. N. Blevins	74 Fairview Av., West Toronto	2nd and 4th Sunday, 1s
International Brotherhood of Stationary Firemen, No. 300	A. A. Woodward.	741 Markham St., Toronto	Geo. T. McCann.	35 Marlborough Av., Toronto	Tuesday, 2 p.m. 2nd and 4th Thursday.
Fur Cutters' and Workers' Union, No. 14,202	Len. Benson	697 Pape Ave., Toronto.	Alf. Mullahy	561 Logan Av., Toront	1st and 3rd Wednesday
Fur Workers' Union, No. 14,187	Joe Weintzweig	59 Huron St., Toronto.	Philip Lipson	112 Parliament St., Toronto	2nd and 4th Wednesday.
United Garment Workers of America, No. 33 (Ladies' Cutters)	H. Richardson	278 Berkeley St., Toronto	H. Collins	171 Elizabeth St., Toronto	Every Monday.
United Garment Workers of America, No. 185 (Cutters, etc.)	Fred Bush	1115 College St., Toronto	H. A. Keller	59 Grange Av., Toronto	2nd and 4th Friday.
United Garment Workers of America, No. 202	Annie Osler	157 St. Helen's Ave., Toronto	Miss T. Woods.	110 Bellevue Av., Toronto	2nd Monday.
Gas Workers' Federated Union. No. 1	Jos. McDermott.	722 Gerrard St., Toronto	M. F. Mackenzie.	37 Howland Rd., Toronto	Monday, once or twice a month.
Glass Bottle Blowers' Association, No. 66	B. C. Johnson	38 Beaconsfield Ave., Toronto	Howard Munn	164 Argyle St., Toronto	1st Saturday.
Amalgamated Glass Workers' Association, No. 21	J. J. McKenna.	169 Wolfrey Ave., Toronto	J. Warburton	22 Wascana Av., Toronto	1st and 3rd Friday.

Granite Cutters' International Association	Wm. Nettleship..	44 Baker Ave., Toronto	Peter Stewart ..	197 Marlboro Av., Toronto	4th Wednesday.
United Brotherhood Leather Workers' on Horse Goods No. 93	H. O. Smith	30 Price St., Toronto..	C. Coulter	518 Lansdowne Av., Toronto	1st Friday.
Lithographers' International Association, No. 12	Alex. Lennie	391 Carlton St., Toronto	Jas. H. Christie..	104 Palmerston Av., Toronto	2nd and 4th Wednesday.
International Longshoremen's Association, No. 646	J. Dowling	33 Sackville St., Toronto	S. Harford, Sr...	2 Curzon St., Toronto.	1st Sunday.
International Association of Machinists, No. 235	W. C. Hagen	844 Queen St. E., Toronto	Geo. E. Crosseman	273 Arthur St., Toronto	2nd and 4th Wednesdays.
Mailers' Union, No. 5	John J. Gallagher	50 Beaconsfield Avenue, Toronto	E. A. Spanner ..	867 King St. W., Toronto	2nd Sunday afternoon.
International Moulders' Union No. 28	Robt. Harper ...	92 O'Hara Av., Toronto	Robt. Harris ...	110 Ossington Ave., Toronto	1st and 3rd Wednesdays.
International Moulders' Union No. 207 (Brass)	A. V. Mann	44 Geneva Ave., Toronto	W. G. Jones	19 Tiverton Avenue, Toronto	1st and 3rd Fridays.
Moving Picture Machine Operators, No. 173	F. Rynas	984 Bathurst St., Toronto	R. Mitchell	184 Grange Avenue, Toronto	1st and 3rd Sundays.
Musical Protective Association No. 149	J. E. Jarratt	1405 King St. W., Toronto	Jos. Ball	Musicians' Temple, University Ave., Toronto	1st Sunday, 2.15 p.m.
Painters, Paperhangers, etc., No. 3	G. E. Phillips ..	30 Prospect St., Toronto	John W. Williams	2 Prospect St., Toronto	2nd and 4th Tuesdays.
Painters, Paperhangers, etc., No. 737	Jas. Buttlie	227 Bolton Av., Toronto	Chas. Risley	219 Sherbourne St., Toronto	2nd and 4th Wednesdays.
Pattern Makers Association ..	Fred. Bancroft ..	14 Lincoln Av., Toronto	Jas. Graham	270 Delaware Avenue, Toronto	2nd and 4th Mondays.
International Photo-Engravers' Union, No. 35	A. Rothwell	16 Major St., Toronto..	F. Hodgetts	106a McCaul St., Toronto	1st Monday.
Operative Plasterers' International Association, No. 48	D. A. Webber ...	709 Manning Ave., Toronto	W. J. Hamilton..	307 Salem Av., Toronto	2nd and 4th Thursdays.
Plumbers', Gasfitters', etc., Union, No. 46	Dav. Bullock ...	256 Kingston Rd., Toronto	Dav. Rattray ...	766 Dovercourt Rd., Toronto	2nd and 4th Fridays.
Polishers, Platers, etc., No. 21	Alf. J. Atkinson.	349 Grace St., Toronto.	Walt. Driscoll ..	24 Sword St., Toronto.	2nd and 4th Wednesdays.
Printers' Pressmen's Union No. 1 (Web)	Geo. Edmonson..	11 Wright Ave., Toronto	W. Hall	113½ Lansdowne Ave., Toronto	3rd Monday.
Amalgamated Sheet Metal Workers' International Alliance, No. 30	D. McCarthy	406 Spadina Ave., Toronto	A. J. Murray	40 Hastings Avenue, Toronto	1st and 3rd Fridays.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Continued.*

Name of Organization.	Name of President.	President's Address.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
Toronto.—*Con.*					
Slate and Tile Roofers' Union, No. 39	E. T. Smith	91 Withrow Ave., Toronto	Jas. Patrick	942 Queen St. E., Toronto	1st and 3rd Mondays.
International Association Steam Fitters, etc., No. 78	E. Lawson	110 Godfrey St., Toronto	Wm. Mackenzie	139 Lisgar St., Toronto	2nd and 4th Fridays.
Stereotypers' and Electrotypers' Union, No. 21	Henry Perkins	293 Milton Av., Toronto	Edgar Young	442 West Marion St., Toronto	1st Thursday.
Journ. Stonecutters' Association	Dav. Crockatt	10 Wood St., Toronto	Harry Newson	32 Hazelwood Ave., Toronto	2nd and 4th Fridays.
Amalgamated Association Street and Electric Railway Employees, No. 113	H. C. Johnston	78 Grant St., Toronto	Jos. Gibbons	167 Church St., Toronto	1st Monday, 8 p.m.; 3rd Sunday, 2 p.m.
Journ. Tailors' Union, No. 132	E. H. Glenn	7 Alexander St., Toronto	James Watt	Labor Temple	2nd and 4th Mondays.
Journ. Tailors' Union, No. 156	T. Curtts	c/o Agnew, Merchant Tailor, W. Toronto	W. W. Greenwood	213 Symington Avenue, Toronto	2nd Monday.
Team Owners' Association	Jos. Caldwell	33 Hamilton St., Toronto	J. Gosnell	102 Sherbourne Street, Toronto	1st and 3rd Thursdays.
International Brotherhood of Teamsters, No. 457 (Coal Drivers)	Walt. Osborne	811 Bathurst St., Toronto	H. R. Barton	36 Sully Cres., Toronto	1st and 3rd Sunday afternoons.
International Brotherhood of Teamsters, No. 458 (Milk Drivers)	A. E. Ide	111 DeGrassi St., Toronto	A. E. Ide	111 DeGrassi St., Toronto	1st and 3rd Wednesday afternoons.
Commercial Telegraphers of America, No. 6	M. Mackay	79 Hutchison St., Montreal, Que.	C. E. Hill	362 Brock Av., Toronto	Once a month.
Tile Setters' Union, No. 37	Jas. Cowan	42 Hallam St., Toronto	Howard Crockford	36 Wheeler Avenue, Toronto East	1st and 3rd Fridays.
Brotherhood of Railway Trainmen, No. 255	T. L. H. McQuire	115 Fermanagh Ave., Toronto	J. H. Davison	168 St. John's Road, Toronto	1st and 3rd Sundays; alt. Mondays, except those following 3rd Sunday, 7.30 p.m.
Brotherhood of Railway Trainmen, No. 322	L. S. Ward	234 Pearson Ave., Toronto	H. T. Meredith	282 Crawford St., Toronto	1st Sunday, 2.30 p.m.;

Travellers' Goods and Leather Novelties' Union, No. 5 ...	R. J. Hodge	630 Ossington Ave., Toronto	Wm. J. Duncan.	195 Osler Ave., Toronto	2nd Wednesday.
Typographical Union, No. 91.	A. E. Thompson.	624 Ontario St., Toronto	Sam. Hadden ...	77 Victoria St., Toronto	1st Saturday.
Upholsterers' International Union, No. 30	R. Williams	1 Newsham St., Toronto	F. Moore	34 McGill St., Toronto.	1st and 3rd Fridays.
Waiters' Union, No. 300.....	Vernon Davey ..	400 Sackville St., Toronto	F. H. Benmore ..	20 West St., Toronto..	2nd and 4th Wednesdays, 8.30 p.m.
Webbwood:					
Brotherhood of Maintenance of Way Employees, No. 70..	W. S. Smith	Wallace, Ont.	W. McCarthy ...	Webbwood	3rd Saturday.
Welland:					
Amalgamated Society Carpenters and Joiners, No. 809..	Geo. Urquhart ..	Garner Ave., Welland.	Wm. Powie	River Road, Welland..	2nd and 4th Mondays.
United Brotherhood Carpenters and Joiners, No. 969...	O. Miller	Welland	Byron Jackson ..	Box 897, Welland	2nd and 4th Fridays.
International Association of Machinists, No. 131	Edw. F. Verellen.	Asher St., Welland ...	W. T. Nobler	Box 307, Welland	1st and 3rd Mondays.
International Moulders' Union, No. 472	Reuben Casson ..	Welland	Edgar Jones	Box 272, Welland	1st and 3rd Wednesdays.
West Port:					
Brotherhood of Railway Carmen, No. 437	C. H. Smith	Minnesota St., Fort William	Sam. Speed	510 Laird Street, Fort William	Last Tuesday.
Windsor:					
Journeymen Barbers' International Union, No. 451	Wm. Holmes	42 Sandwich St. E., Windsor	Arthur Wickens..	18 Ouellette Av., Windsor	4th Wednesday .....
Bricklayers', Masons' and Plasterers' International Union, No. 6	Ch. S. Chisenso .	85 Pierce Ave., Windsor	Rupert G. Thompson	72 Cameron Av., Windsor	Every Wednesday.
Order of Railway Conductors, No. 494	M. Inkester	Labelle Terrace, Windsor	G. Jackson	115 Goyeau St., Windsor	2nd and 4th Sunday afternoons.
National Association Marine Engineers of Canada, No. 11	Alex. McDonald .	28 Crawford Av., Windsor	Neil Maitland ..	221 London St. W., Windsor	
Brotherhood of Locomotive Firemen and Enginemen, No. 421	Jos. L. Pero	69 Arthur St., Windsor	A. R. Butts	28 Glengarry Avenue, Windsor	4th Tuesday.
United Garment Workers of America, No. 190	Emma Overs	126 Assumption Street, Windsor	Eva Grondin	Walkerville, Ont.	2nd Wednesday.
Painters, Decorators, etc., of America, No. 629	....	....	R. H. Brumpton.	64 Erie St., Windsor..	1st Tuesday.
Operative Plasterers' International Union, No. 345	.....	.....	Chas. McVoy ...	55 Elliott St., Windsor	Thursday.
United Association Plumbers, etc., No. 552	Peter Smith	Windsor	Arthur C. Longley	Box 242, Walkerville..	1st and 3rd Fridays.

DIRECTORY OF LABOUR ORGANIZATIONS IN ONTARIO.—*Concluded.*

Name of Organization	Name of President	President's Address.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
Windsor.—*Continued.*					
Sheet Metal Workers' International Alliance, No. 320	John R. Mason	London St. E., Windsor	H. C. Cailey	20 Aylmer Ave., Windsor	2nd and 4th Fridays.
Switchmen's Union of North America, No. 184	Thos. Barrows	Campbell Av., Windsor	J. J. Lonnie	68 Crawford Av., Windsor	1st Sunday, 3rd Thursday.
Brotherhood of Railway Trainmen, No. 316	F. W. Addissen	64½ Oak Ave., Windsor	Chas. Weldrick	168 Dougal Ave., Windsor	2nd and 3rd Sundays, 10.30 a.m.; 1st and 3rd Wednesdays, 8.30 p.m.
Typographical Union, No. 553	Walter Black	137 Janet Av., Windsor	Geo. E. Maretette	98 Albert St., Windsor.	Last Sunday.
Woodstock:					
Bricklayers' and Masons' Union, No. 22	Fred. Adams	501 Grace St., Woodstock	Arthur Howe	305 Vincent St., Woodstock	2nd and 4th Tuesdays
Moulders' International Union, No. 249	Geo. Gallagher	Woodstock	H. E. Porter	Box 746, Woodstock	3rd Friday.
Journeymen Tailors' Union of America, No. 33	Jos. Cross	Woodstock	R. B. Heppenstall	Box 605, Woodstock	3rd Tuesday.
Typographical Union, No. 317	Walt. Stallan	Express Printing Co., Woodstock	Jack G. Reid	Box 758, Woodstock	Monday night.

WAGES AND HOURS OF LABOUR.

The following table shows the average wages per week and hour and the hours of work for organized and unorganized labour. The figures are taken from the schedules returned to us by the secretaries of unions, some being calculated, as the wages per hour from the weekly wages and working hours, or the weekly wages from the daily wages and working hours. It would be more satisfactory if the secretaries themselves gave these details in full, and also were more explicit in reporting the wages and hours for unorganized labour. We may remark that some secretaries report the weekly wages as far lower than the amount of the hourly wages multiplied by the hours of labour, evidently in the cases of the building and other seasonable trades, dividing the yearly wage by the 52 weeks to make an average. This is unnecessary, as the column showing the average days idle gives the material for calculating this reduction when desired, and for obvious reasons it is not desirable to make the weekly wages, when employed, seem less than the reality.

WAGES AND HOURS OF LABOUR.

Table showing average wages per week and hour, and hours of labour, with comparison between those organized and unorganized in localities as reported also number of days idle and periods of wage payment.

Location and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average days idle.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
ALLANDALE:	$ c.	$ c.	c.	c.								
Order of Railway Conductors, No. 355	25 00	25 00	35	35	.....	.....	.....	.....	.....	.....	none	monthly
Bro. of Locomotive Engineers, No. 486	mileag	e basis	.....	same	milea	ge basis	.....	.....	.....	.....	.....	monthly
Bro. of Railway Trainmen, No. 377	mileag	e syste	m 24	24	milea	ge syst	em..	.....	.....	.....	varies	monthly
AMHERSTBURG:												
Drivers, Tenders and Derrick Men, No. 377	21 53	.....	31	.....	50	.....	10	.....	60	.....	.....	fortnightly
Int. Rock Drillers' Assoc.	19 80	all org	30	.....	55	.....	11	.....	66	.....	100	fortnightly
Int. Bro. Steam Shovel and Dredgemen, No. 20	30 00	all org	35	.....	60	.....	12	.....	72	.....	60	fortnightly
BEAVERTON:												
Bro. of Maintenance of Way Empl., No. 262	10 00	.....	15½	.....	50	.....	10	.....	60	.....	.....	monthly
BELLEVILLE:												
Bricklayers' and Masons', etc., Union, No. 30	20 90	18 00	35	30	45	50	9	10	54	60	84	weekly
Bro. of Loco. Engineers, No. 189	35 00	35 00	40	40	50	50	10	10	60	60	15	monthly
Bro. of Loco. Firemen and Enginemen, No. 66	20 00	20 00	.....	.....	.....	.....	.....	.....	.....	.....	none	monthly
BERLIN:												
Journ. Barbers' Int. Union, No. 304	13 00	.....	17½	.....	60	.....	16	.....	76	.....	.....	weekly
Brewery Workers' Union, No. 170	13 00	11 25	22½	20½	47½	47½	7½	7½	55	55	none	fortnightly
Bricklayers' and Masons', etc., Union, No. 12	21 60	18 00	45	30	40	50	8	10	48	60	100	fortnightly
Bro. of Carpenters and Joiners, No. 553	16 80	16 80	31½	28	45	50	9	10	54	60	75	fortnightly
Cigar Makers' Int. Union, No. 422	11 00	7 50	25	14	40	50	4	5	44	55	20	weekly
Boot and Shoe Workers' Union, No. 206 (Male)	10 80	10 80	18	18	50	50	7½	7½	57½	57½	18	fortnightly
Boot and Shoe Workers' Union, No. 206 (Female)	9 00	9 00	15	15	50	50	7½	7½	57½	57½	18	fortnightly
Hodcarriers' and Builders' Labourers' Union, No. 160	15 36	all org	30	.....	40	.....	8	.....	48	.....	100	fortnightly
Fed. Labour Union, No. 17	10 60	9 00	18	15	50	50	9	9	59	59	100	fortnightly
Fed. Assoc. Letter Carriers	12 50	12 50	22½	22½	45	45	9	9	54	54	none	fortnightly
Musicians' Protective Assoc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

United Assoc. Plumbers' Union, No. 527	16 50	16 50	30	30	50	50	5	5	55	55	none	week. or fort.
Journ. Tailors' Union of America, No. 264 (Male)	12 00	10 20	20	17	50	50	10	10	60	60	30	fortnightly
Journ. Tailors' Union of America, No. 264 (Female)	9 00	7 65	15	13	50	50	10	10	60	60	30	fortnightly
BLENHEIM:												
Bro. of Maintenance of Way Emp., No. 502	9 65	9 65	16½	16½	50	50	10	10	60	60	none	monthly
BOWMANVILLE:												
Glove Workers' Union, No. 43 (Male)	14 00	14 00	30	25	42½	50	4	5	46½	55	12	weekly
Glove Workers' Union, No. 43 (Female)	9 00	9 00	20	16	42½	50	4	5	46½	55	12	weekly
BRANTFORD:												
Journ. Barbers' Int. Union, No. 298	13 00	all org	20	.....	50	.....	15	.....	65	.....	none	weekly
Bartenders' Int. Union, No. 182	15 00	.....	23	.....	55	.....	11	.....	66	.....	.....	weekly
Bricklayers' and Masons' and P. Union, No. 9	21 00	13 20	48	30	40	40	4	4	44	44	100	weekly
Amalg. Soc. Carpenters and Joiners, No. 783	18 24	15 40	32	27	50	50	7	7	57	57	50	weekly
United Bro. of Carpenters and Joiners, No. 498	16 50	13 50	30	25	50	50	5	5	55	55	50	weekly
Can. Assoc. of Stationary Engineers, No. 4	12 00	12 00	20	20	50	50	5	5	55	55	none	week. or fort.
Fed. Assoc. of Letter Carriers, No. 13	14 25	.....	30	.....	40	40	8	8	48	48	none	fortnightly
Iron Moulders' Union, No. 29	16 50	12 50	27½	20	50	50	9	9	59	59	none	3 times mo'th
Painters' and Decorators', etc., Union, No. 313	11 30	7 30	21	13½	45	45	9	9	54	54	65	weekly
Opera. Plasterers' Int. Assoc., No. 164	22 50	22 50	45	45	45	45	5	5	50	50	90	weekly
Journ. Plumbers', etc., Union, No. 186	18 75	15 15	37½	27½	45	50	5	5	50	55	14	weekly
Journ. Tailors' Union of America, No. 117 (Male)	15 00	10 00	25	17	50	50	10	10	60	60	80	weekly
Journ. Tailors' Union of America, No. 117 (Female)	10 80	7 20	18	12	50	50	10	10	60	60	80	weekly
Typographical Union, No. 378	14 50	a l org	30	.....	42½	42½	5½	5½	48	48	.....	weekly
BRIDGEBURG:												
United Bro. of Carpenters and Joiners, No. 1850	18 90	14 85	35	27½	45	45	9	9	54	54	60	weekly
Bro. of Railway Carmen, No. 10	14 40	14 40	18	18	50	50	10	10	60	60	none	monthly
Bro. of Locomotive Engineers, No. 679	32 76	32 76	39	39	60	60	12	12	72	72	12	monthly
BROCKVILLE:												
Journ. Barbers' Int. Union of America, No. 387	12 00	.....	22	.....	55	55	14	14	69	69	.....	weekly
United Bro. Carpenters and Joiners, No. 799	18 00	13 50	33¼	25	45	45	9	9	54	54	.....	weekly
Bro. of Locomotive Engineers, No. 118	25 00	25 00	mil'ge	syst'm	mil'ge	syst'm	.....	.....	.....	.....	varies	monthly
Int. Moulders' Union, No. 329	14 50	14 50	25½	25½	47½	47½	9½	9½	57	57	none	fortnightly
Journ. Tailors' Union of America, N. 262 (Male)	10 00	9 00	17	15	45	45	10	10	55	55	30	weekly
Journ. Tailors' Union of America, No. 262 (Female)	6 50	5 85	12	11	45	45	10	10	55	55	30	weekly
CARLETON PLACE:												
Int. Bro. Blacksmiths', etc., Union	14 00	.....	25	.....	45	.....	5	.....	50	.....	15	monthly
Int. Assoc. of Machinists, No. 211	16 50	16 15	33	33	45	45	5	5	50	50	13	monthly
Maintenance of Way Employees, No. 222	.....	.....	.....	.....	50	50	10	10	60	60	none	monthly
Metal Polishers', Buffers', etc., Union, No. 96	19 80	all org	33	.....	50	.....	10	.....	60	.....	none	fortnightly
Int. Moulders' Union, No. 362	21 00	21 00	35	35	50	50	10	10	60	60	....	fortnightly
Bro. of Railway Carmen, No. 229	12 50	12 50	25	25	45	45	5	5	50	50	...	monthly
Stove Mounters', etc., Union, No. 78	18 00	18 00	30	30	50	50	10	10	60	60	....	fortnightly

Table showing average wages and hours of labour, etc. —*Continued.*

Location and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average days idle.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
CHAPLEAU:	$ c.	$ c.	c.	c.								
Bro. of Loco. Engineers, No. 319	mileag	e basis	.....	.....	mileag	e basis	.....	.....	.....	.....	none	monthly
Bro. of Loco. Firemen and Enginemen, No. 321	variab	.....	.....	.....	variab	.....	.....	.....	.....	.....	none	monthly
Int. Assoc. of Machinists, No. 535	25 00	25 00	39	39	50	50	5	5	55	55	none	monthly
Maintenance of Way Employees, No. 237	11 40	10 50	19	17½	50	50	10	10	60	60	none	monthly
CHATHAM:												
Canadian Assoc. Stationary Engineers, No. 21	13 50	.....	22½	.....	50	.....	9	.....	59	.....	none	fortnightly
United Garment Workers' Assoc., No. 44	7 50	all org	17	.....	40	.....	4½	.....	44½	.....	.....	weekly
Typographical Union, No. 421	13 00	13 00	27	27	40	40	8	8	48	48	none	weekly
COATSWORTH:												
Order of Railway Telegraphers, No. 39	15 00	15 00	21	21	60	60	12	12	78	78	none	monthly
COBALT:												
Western Fed. of Miners, No 146	17 00	13 25	35	23½	47½	47½	8½	9½	56	57	une'tn	monthly
Order of Railway Telegraphers, No	20 00	20 00	28	28	60	60	12	12	72	72	12	monthly
COBURG:												
Int. Moulders' Union, No. 189	27 00	.....	45	.....	50	.....	10	.....	60	.....	90	fortnightly
COLBORNE:												
Maintenance of Way Employees, No. 288	10 20	9 00	17	15	50	50	10	10	60	60	none	monthly
COLLINGWOOD:												
Journ. Barbers' Int. Union, No. 528	12 00	12 00	19	19	50	50	13	13	63	63	none	weekly
Bricklayers' and Masons' Union, No. 19	21 60	12 60	40	20	45	52½	9	10½	54	63	175	fortnightly
Amal. Society of Carpenters and Joiners, No.	18 70	13 80	27½	20	59	59	9	9	68	68	.....	fortnightly
Labourers' Protective Union, No. 14106	13 50	9 45	25	17½	45	45	9	9	54	54	150	fortnightly
Int. Longshoremen's Union, No. 476	15 00	10 50	25	17½	50	50	10	10	60	60	varies	end of job
Amal. Society of Engineers	18 80	.....	27½	.....	50	.....	7½	.....	57½	.....	.....	fortnightly
CORNWALL:												
Journ. Tailors' Union of America, No. 5679	12 00	.....	20	.....	50	.....	10	.....	60	.....	25	weekly
CROOKSTON:												
Journ. Stonecutters' Assoc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

DESERONTO:												
Order of Railway Telegraphers, No. 43 (Male)	8 00	8 00	12	12	65	65	13	13	78	78	none	monthly
Order of Railway Telegraphers, No. 43 (Female)	6 00	6 00	10	10	65	65	13	13	78	78	none	monthly
DUNDAS:												
Int. Moulders' Union, No. 269	15 00	15 00	28	28	50	50	5	5	55	55	.....	fortnightly
ELK LAKE:												
Western Fed. of Miners, No. 140	20 00	.....	35	.....	45	.....	9	.....	54	.....	60	monthly
ELMIRA:												
Int. Wood Workers of America, No. 129	11 50	11 50	20	20	50	50	5	5	55	55	none	fortnightly
ESPANOLA:												
Int. Bro. of Paper Makers, No. 156	16 80	.....	35	.....	40	.....	8	.....	48	.....	none	fortnightly
ESSEX:												
Maintenance of Way Employees	.....	.....	.....	.....	50	50	9	9	59	59	none	monthly
FORT FRANCES:												
Maintenance of Way Employees, No. 313	15 60	15 00	25	25	50	50	10	10	60	60	none	monthly
FORT WILLIAM:												
Bartenders' Union, No. 761	20 00	20 00	40	40	42½	42½	6½	6½	49	49	.....	monthly
Int. Bro. of Boiler Makers, etc., No.	22 00	18 75	44	31¼	45	55	5	5	50	60	30	monthly
Bricklayers', Masons' and P. Union, No. 25	25 00	all org	60	.....	45	.....	9	.....	54	.....	120	fortnightly
Int. Assoc. of Bridge and Struct. Iron Workers, No. 53	27 00	21 60	50	40	45	45	9	9	54	54	.....	wk., f., m.
Amal. Society Carpenters and Joiners	24 00	24 00	40	40	50	50	10	10	60	60	50	.....
Order of Railway Conductors, No. 286	35 00	35 00	mile'g	.....	mile'g	.....	.....	.....	.....	.....	none	monthly
Bro. of Loco. Engineers, No. 243	30 00	30 00	46½	46½	mile'g	.....	.....	.....	.....	.....	none	monthly
Bro. of Loco. Firemen and Enginemen, No. 308	20 00	20 00	25	25	mile'g	.....	.....	.....	.....	.....	none	monthly
Int. Longshoremen's Assoc., No. 479 (Grain)	20 00	20 00	25	25	60	60	15	15	75	75	150	weekly
Int. Longshoremen's Assoc., No. 746 (Coal)	18 00	18 00	30	30	50	50	10	10	60	60	75	monthly
Int. Assoc. of Machinists, No. 309	22 50	16 50	45½	33	45	45	5	5	50	50	22	monthly
Maintenance of Way Employees, No. 128	varies	.....	varies	.....	50	50	10	10	60	60	.....	monthly
Int. Moulders' Union, No. 429	18 00	18 00	30	30	50	50	10	10	60	60	50	fortnightly
Int. Assoc. Plumbers, etc., No. 257	27 00	.....	55	.....	45	.....	4½	.....	49½	.....	90	fortnightly
Bro. of Railway Trainmen, No. 306	25 00	25 00	28	28	mil'ge	.....	.....	.....	.....	.....	none	monthly
Typographical Union, No. 417	21 00	all org	43½	.....	40	.....	8	.....	48	.....	none	weekly
GALT:												
Journ. Barbers' Int. Union, No. 413	12 00	.....	19	.....	50	.....	15	.....	65	.....	.....	weekly
Bricklayers', Masons' and P. Union, No. 15	24 00	27 00	50	45	40	50	8	10	48	60	175	weekly
Un. Bro. Carpenters and Joiners, No. 1216	16 50	12 37	30	22½	50	50	5	5	55	55	40	fortnightly
Amal. Soc. of Engineers, No. 680	.....	.....	.....	.....	50	.....	5	.....	55	.....	.....	fortnightly
Int. Assoc. of Machinists, No. 120	13 00	13 00	24	24	50	50	5	5	55	55	.....	fortnightly
Int. Moulders' Union, No. 447	14 00	14 00	25	25	50	50	5	5	55	55	25	fortnightly
Typographical Union, No. 411	14 00	12 00	29½	22¼	43	45	5	9	48	54	.....	weekly
GRAHAM:												
Bro. of R. Carmen, No. 28	15 60	15 60	26	26	50	50	10	10	60	60	none	monthly

Table showing average wages and hours of Labour, etc. —*Continued.*

Location and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average days idle.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
GUELPH:	$ c.	$ c.	c.	c.								
Journ. Barbers' Int. Union, No. 310	13 00	13 00	20½	20½	50	50	13	13	63	63	30	weekly
Bartenders' Union, No. 104	16 00	13 00	22½	18	60	60	12	12	72	72	3	weekly
United Brewery Workers, No. 300	10 00	10 00	17	17	47½	47½	5	5	52½	52½	none	fortnightly
Bricklayers', Masons' and P. Union, No. 3	24 00	.....	50	.....	40	.....	8	.....	48	.....	125	week. or fort.
Letter Carriers' Association, No. 18	14 00	.....	23⅜	.....	45	.....	9	.....	54	.....	none	fortnightly
Int. Moulders' Union	20 00	18 00	35	31½	47½	47½	8½	8½	56	56	.....	week. or fort.
Piano, Organ and Mus. Inst. Workers, No. 34	12 50	12 50	22½	22½	47½	47½	4½	4½	52	52	20	fortnightly
Int. Moulders' Union	18 00	18 00	25	25	50	50	9	9	59	59	none	weekly
Typographical Union, No. 391	15 00	15 00	31¼	31¼	42	42	6	6	48	48	none	weekly
HAMILTON:												
Journ. Barbers' Int. Union, No. 131	14 00	10 00	22	15½	51¼	51¼	13¼	13¼	64½	64½	none	weekly
Bartenders' Int. League, No. 197	15 00	10 00	25	17	50	50	10	10	60	60	none	weekly
Int. Bro. of Bookbinders, No. 114	14 50	14 50	30	30	44	44	4	4	48	48	none	weekly
Boot and Shoe Workers' Union, No. 228	pc.wk.	all org	.....	.....	50	.....	5	.....	55	.....	6	weekly
Boot and Shoe Workers' Union, No. 232 (Cutters)	14 85	all org	27	.....	50	.....	5	.....	55	.....	20	weekly
Boot and Shoe Workers' Union, No. 234 (Female)	8 00	8 00	15	15	45	45	4	4	49	49	14	weekly
Boot and Shoe Workers' Union, No. 444	12 00	12 00	20	20	55	55	5	5	60	60	7	weekly
Brewery Workers' Union, No. 312	13 00	13 00	25½	25½	45	45	5	5	50	50	30	weekly
Bridge and Structural Iron Workers, No. 95	17 50	.....	35	.....	45	.....	5	.....	50	.....	.....	fortnightly
Broom and Whisk Makers' Union, No. 9	14 00	all org	28	.....	45	.....	4½	.....	49½	.....	10	weekly
Amal. Soc. Carpenters and Joiners, No. 855	17 60	.....	40	.....	40	.....	4	.....	44	.....	60	fortnightly
United Bro. Carpenters and Joiners, No. 18	17 60	16 50	40	30	40	50	5	.....	44	55	50	fortnightly
Bro. of Cement Workers, No. 170	22 00	18 00	50	32½	40	50	4	5	44	55	.....	fortnightly
Cigar Makers' Union, No. 55	13 00	all org	30	.....	40	.....	4	.....	44	.....	15	weekly
Order of Railway Conductors	25 00	25 00	42	42	50	50	10	10	60	60	none	monthly
Bro. of Loco. Engineers, No. 133	25 00	25 00	35	35	60	60	12	12	72	72	none	monthly
Canadian Assoc. Stationary Engineers, No. 2	13 50	13 50	22½	22½	50	50	10	10	60	60	.....	fortnightly
Int. Journ. Horseshoers, No. 72	14 00	11 00	26	20	50	50	5	5	55	55	25	weekly
United Garment Workers of America, No. 256	15 00	15 00	30⅝	30⅝	45	45	4	4	49	49	none	weekly

Bro. of Loco. Firemen and Enginemen, No. 151	12 00	12 00	20	20	50	50	10	10	60	60	none	monthly
Fed. Labour Union, No. 11 (City Firemen)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	fortnightly.
Lathers, Wood, Wire, etc., Int. Union, No. 145	17 50	17 50	40	35	40	45	4	5	44	50	80	weekly
Int. Longshoremen's Assoc.	13 00	.....	30	.....	40	.....	4	.....	44	.....	unct'n	end of job
Int. Moulders' Union, No. 26	15 00	.....	27½	.....	50	.....	5	.....	55	.....	.....	week. or fort.
Musicians' Protective Assoc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bro. of Painters, Decorators, etc., No. 205	15 00	14 00	32½	25	42½	52½	4	4	46½	56½	60	weekly
Operative Plasterers' Int. Union, No. 298	22 00	18 70	50	42½	40	40	4	4	44	44	90	fortnightly
Polishers', Buffers', etc., Union of N. A., No. 26	16 50	11 50	30	20	50	50	5	5	55	55	.....	fortnightly
Pressmen and Assistants' Union, No. 176 (Pressmen)	16 40	16 40	33⅓	33⅓	43½	43½	4½	4½	48	48	none	weekly
Pressmen and Assistants' Union (Feeders)	9 00	9 00	18¾	18¾	43½	43½	4½	4½	48	48	none	weekly
Sheet Metal Workers' Union, No. 61	16 25	10 00	32½	17½	45	50	5	5	50	55	15	weekly
Int. Alli. Theatrical Stage Empl., No. 129	15 00	15 00	42	42	30	30	6	6	36	36	50	weekly
Stone Cutters' Assoc. of N. A.	20 00	all org	47½	.....	44	.....	4	.....	44	.....	80	fortnightly
Stove Mounters' Int. Union, No. 35	13 75	.....	25	.....	50	.....	5	.....	55	.....	25	fortnightly
Street and Electric Railway Employees, No. 107	13 00	13 00	20	20	55	55	11	11	66	66	none	fortnightly
Journ. Tailors Union of America, No. 149 (Custom)	15 00	15 00	25	25	50	50	10	10	60	60	28	weekly
Order of Railway Telegraphers, No. 155	varies	.....	.....	.....	varies	.....	.....	.....	.....	.....	none	monthly
Tobacco Workers' Int. Union, No. 48	pc.wk.	.....	.....	.....	50	50	5	5	55	55	75	weekly
Bro. of Railway Trainmen, No. 226	21 00	21 00	30	30	50	50	10	10	70	70	none	monthly
Typographical Union, No. 129	18 00	.....	38	.....	43	.....	5	.....	48	.....	none	weekly
HAVELOCK:												
Order of Railway Conductors, No. 578	37 50	37 50	36	36	mil'ge	.....	.....	.....	.....	.....	30	monthly
Bro. of Loco. Engineers, No. 658	35 00	35 00	40	40	irr'g'r	.....	.....	.....	.....	.....	none	monthly
Bro. of Railway Trainmen, No. 293	26 50	26 50	36	36	as r'qd	.....	.....	.....	.....	.....	none	monthly
HERON BAY:												
Bro. of Maintenance of Way Empl., No. 231	11 40	10 50	19	17½	50	50	10	10	60	60	none	monthly
INGERSOLL:												
Bro. of Maintenance of Way Empl., No. 503	10 20	10 20	17	17	50	50	10	10	60	60	none	monthly
KENORA:												
Bro. of Railway Carmen	14 00	14 00	26½	26½	45	45	5	5	50	50	20	monthly
Bro. of Loco. Engineers, No. 535	45 00	45 00	45	45	varies	.....	.....	.....	.....	.....	none	monthly
Int. Assoc. of Machinists, No. 28	24 50	.....	45½	.....	45	.....	9	.....	54	.....	.....	monthly
Machinists' Helpers, No. 12946	14 60	14 60	27	27	47½	47½	9½	9½	57	75	none	monthly
Bro. of Railway Trainmen, No. 270	30 00	30 00	35	35	varies	.....	.....	.....	.....	.....	none	monthly
KINGSTON:												
Journ. Barbers' Int. Union, No. 514	12 00	12 00	15⅓	15⅓	50	50	13	13	63	63	none	weekly
Bricklayers', Masons', etc., Int. Union, No. 10	24 00	15 60	50	32½	40	40	8	8	48	48	100	fortnightly
Int. Building Laborers' Union, No. 66	13 40	10 50	28	18	40	47½	8	9½	48	57	90	fortnightly
United Bro. of Carpenters and Joiners, No. 249	16 80	12 00	35	27	40	47½	8	9½	48	57	30	fortnightly
Letter Carriers' Union, No. 8	15 00	15 00	28	28	45	45	9	9	54	54	none	fortnightly
Longshoremen's Union, No. 229	15 00	.....	25	.....	50	.....	10	.....	60	.....	75	weekly
Nat. Assoc. of Marine Engineers, No. 4	16 50	16 50	27½	27½	50	50	10	10	60	60	varies	week. or mon.
Masters' and Mates' Assoc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	150	
Int. Moulders' Union, No. 252	17 00	all org	27½	.....	50	.....	5	.....	55	.....	none	fortnightly

Table showing average wages and hours of Labour, etc.—*Continued.*

Location and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average days idle.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
KINGSTON.—*Continued.*	$ c.	$ c.	c.	c.								
Bro. Painters, Decorators, etc., No. 114	15 00	.....	27½	.....	45	45	9	9	54	54	30	week. or fort.
Plumbers', etc., Int. Union, No. 221	16 50	16 50	35	35	40	40	8	8	48	48	25	weekly
Ship Carpenters' and Caulkers' Union, No. 46	18 00	10 50	33⅓	17½	45	50	9	10	54	60	.....	weekly
Journ. Stone Cutters' Assoc.	21 60	.....	45	.....	40	.....	8	.....	48	.....	75	fortnightly
Journ. Tailors' Union of America, No. 263	12 00	less	28	less	45	45	8	8	43	43	50	weekly
Typographical Union, No. 204	14 40	12 00	30	22½	43	49	5	5	48	54	none	weekly
LEAMINGTON:												
Maintenance of Way Empl., No. 302	9 00	9 00	15	15	50	50	10	10	60	60	none	monthly
LINDSAY:												
Order of Railway Conductors, No. 322	28 80	28 80	40	40	60	60	12	12	72	72	30	monthly
Bro. of Loco. Engineers, No. 174	30 00	30 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	monthly
Bro. of Loco. Firemen and Enginemen, No. 136	17 00	17 00	25	25	50	50	10	10	60	60	20	monthly
Bro. of Railway Trainmen, No. 308	16 00	16 00	.....	.....	.....	.....	.....	.....	.....	.....	50	monthly
LONDON:												
Journ. Barbers' Int. Union, No. 366	14 00	11 50	22	17½	50	55	12	12	62	67	none	weekly
Bartenders' Int. League, No. 137	12 00	less	25	less	40	40	8	8	48	48	none	weekly
Int. Ass. Bill Posters, etc., No. 22	12 00	10 00	25	22	40	40	8	8	48	48	none	weekly
United Brewery Workmen, No. 381	10 25	10 25	19	19	47½	47½	6	6	53⅓	53⅓	none	weekly
Bricklayers' and Masons' Int. Union, No. 5	22 00	22 00	50	40	40	47½	4	9½	44	57	100	weekly
Amal. Soc. Carpenters' and Joiners, No. 858	14 00	14 00	28	28	45	45	4½	4½	49½	49½	30	weekly
Unit. Bro. Carpenters and Joiners, No. 1946	14 25	.....	28½	.....	45	.....	5	.....	50	.....	100	weekly
Cigar Makers' Int. Union, No. 278	15 00	9 00	34	20½	40	40	4	4	44	44	none	weekly
Order of Railway Conductors, No. 16	30 00	30 00	35	35	50	50	10	10	70	70	.....	monthly
Int. Bro. Electrical Workers, No. 120	12 00	12 00	22½	22½	45	45	9	9	54	54	50	weekly
Amal. Society of Engineers, No. 709	13 40	12 20	24	22	50	50	5	5	55	55	.....	.....
Bro. of Loco. Engineers	25 00	25 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	monthly
Canadian Asso. Stationary Engineers	15 00	15 00	25	25	50	50	10	10	60	60	none	w. f. or m.
Bro. Loco. Firemen and Enginemen, No. 117	20 00	20 00	27	27	50	50	10	10	60	60	50	monthly
Bro. Loco. Firemen and Enginemen, No. 468	25 00	25 00	35	35	.....	.....	.....	.....	.....	.....	.....	monthly

United Garment Workers of America, No. 33 (Male)	12 00	.....	25	.....	45	.....	4	.....	49	.....	.....	weekly
United Garment Workers of America, No. 33 (Female)	6 00	.....	11	.....	45	.....	4	.....	49	.....	.....	weekly
Garment Cutters' Int. Assoc.	18 00	18 00	37½	37½	40	40	4	4	44	44	48	fortnightly
Fed. Labour Union, No. 5	varies	.....	varies	.....	45	.....	5	.....	50	.....	50	weekly
Letter Carriers' Union, No. 4	16 50	16 50	29	29	46¼	46¼	9½	9½	55¾	55¾	none	fortnightly
Maintenance of Way Empl., No. 2	12 00	12 00	20	20	50	50	10	10	60	60	25	monthly
Musicians' Assoc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Polishers, Buffers, etc., No. 32	19.25	18 00	33⅓	31⅓	50	50	6½	6½	56½	56½	15	week. or fort
United Assoc. Plumbers, etc., No. 289	15 40	12 00	35	27½	40	40	4	4	44	44	15	weekly
Int. Printing Pressmen and Assistants, No. 173	12 00	10 00	25	20	43	45	5	5½	48	50½	.....	weekly
Int. Alli. Theatrical Stage Empl., No. 105	13 50	13 50	25	25	45	45	9	9	54	54	90	weekly
Journ. Stonecutters' Association	19 80	19 80	45	45	40	40	4	4	44	44	90	weekly
Order of Railway Telegraphers, No. 1	14 00	14 00	20	20	60	60	12	12	72	72	none	monthly
Order of Railway Telegraphers, No. 7	17 00	17 00	20	20	60	60	12	12	72	72	none	monthly
Bro. of Railway Trainmen, No. 240	17 00	17 00	milge	basis	milage	basis	.....	.....	.....	.....	none	monthly
Bro. of Railway Trainmen, No. 415	27 50	27 50	32	32	milage	basis	.....	.....	.....	.....	none	monthly
Typographical Union, No. 133	16 00	10 00	33⅓	20	40	45	8	9	48	54	none	weekly
MERRITTON:												
United Bro. Carpenters and Joiners, No. 1402	20 00	15 12	40	30¼	45	45	5	5	50	50	.....	weekly
MIDLAND:												
Int. Longshoremen's Assoc.	.....	.....	irreg	.....	.....	.....	.....	.....	.....	.....	irreg	.....
MELVERTON:												
Maintenance of Way Empl., No. 163	10 20	10 20	17	17	50	50	10	10	60	60	none	monthly
NIAGARA FALLS:												
Amal. Society Carpenters and Joiners, No. 793	19 20	9 60	40	20	40	40	8	8	48	48	36	weekly
United Bro. Carpenters and Joiners, No. 713	19 20	.....	40	.....	40	.....	8	.....	48	.....	50	weekly
Int. United Steam Engineers, No. 232	21 00	19 90	35	33⅓	50	50	10	10	60	60	75	fortnightly
United Hatters of N. A., No. 20	18 50	all org	37	.....	45	.....	5	.....	50	.....	75	weekly
Fed. Assoc. of Letter Carriers, No. 36	12 00	.....	25	.....	40	.....	8	.....	48	.....	.....	fortnightly
Journ. Stonecutters' Association	24 00	24 00	50	50	40	40	8	8	48	48	90	fortnightly
Bro. of Railway Trainmen, No. 379	25 00	25 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	monthly
NORTH BAY:												
Int. Bro. of Blacksmiths, etc., No. 474	15 50	15 50	31½	27½	45	50	5	6	50	56	none	monthly
Bro. of Railway Carmen, No. 192	11 50	11 50	23	23	45	45	5	5	50	50	none	monthly
Bro. of Railway Conductors, No. 242	25 00	allorg	.....	.....	.....	.....	.....	.....	.....	.....	none	monthly
Order of Locomotive Engineers, No. 308	milage	basis	.....	.....	milage	basis	.....	.....	.....	.....	none	monthly
Maintenance of Way Employes, No. 244	10 50	9 60	17½	16	50	50	10	10	60	60	none	monthly
Bro. of Railway Trainmen, No. 249	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	none	monthly
ORANGEVILLE:												
Maintenance of Way Employes, No. 214	13 00	9 60	21	16	50	50	10	10	60	60	none	monthly
OSHAWA:												
Int. Moulders' Union, No 136	15 00	15 00	25	25	50	50	9	9	59	59	none	week .or fort.
Pattern Makers' League, No. 643	14 75	.....	25	.....	50	.....	9	.....	59	.....	.....	fortnightly

Table showing average wages and hours of Labour, etc.—*Continued*.

Location and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average days idle.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
OTTAWA:	$ c.	$ c.	c.	c.								
Int. Brewery Workers' Union, No. 365	12 00	12 00	22	22	50	50	6	6	56	56	40	weekly
Bricklayers' Int. Union, No. 7	23 00	20 00	52	40	40	45	4	5	44	50	145	fortnightly
Building Laborers' Int. Union, No. 4	14 00	12 50	28	25	45	45	5	5	50	50	75	fortnightly
Bro. of Carpenters and Joiners, No. 93	17 50	15 00	35	30	45	45	5	5	50	50	30	week. or fort.
Order of Railway Conductors	30 00	30 00	milage	basis	50	50	10	10	60	60	.....	monthly
Bro. of Loco. Engineers, No. 168	35 00	35 00	39	39	milage	basis	.....	.....	.....	.....	30	monthly
Bro. of Loco. Firemen and Enginemen, No. 172	17 50	17 50	milage	basis	milage	basis	.....	.....	.....	.....	none	monthly
Fed. Labour Union, No. 9	16 00	16 00	28	28	40	40	8	8	48	48	none	fortnightly
Lathers' Int. Union, No. 60	22 50	.....	45	.....	45	.....	5	.....	50	.....	150	weekly
Int. Assoc. of Machinists, No. 412	14 80	.....	27	.....	50	.....	5	.....	55	.....	none	fort. or mon.
Int. Moulders' Union, No. 280	16 25	14 00	28½	24½	50	50	7	7	57	57	.....	fortnightly
Bro. of Painters, Decorators, etc., No. 200	16 25	13 75	32½	27½	45	45	5	5	50	50	20	week. or fort.
Int. Bro. of Paper Makers, No. 34	15 00	15 00	31	31	40	40	8	8	48	48	none	fortnightly
Operative Plasterers' Int. Assoc., No. 124	22 50	16 00	45	32½	45	45	5	5	50	50	45	fortnightly
Plasterers' Labourers' Union, No. 1	15 00	12 50	30	25	45	45	5	5	50	50	60	fortnightly
Press Feeders' and Assistants' Union, No. 9	10 00	5 00	20½	10¼	43	43	5	5	48	48	none	week. or fort.
Printing Pressmen's Union, No. 5	19 00	.....	39½	.....	42½	.....	5	5	47½	.....	none	weekly
Sheet Metal Workers' Union, No. 47	17 50	.....	35	.....	45	.....	5	.....	50	.....	none	weekly
Int. Alli. Theatrical Stage Employes, No. 95	19 00	.....	30	.....	45	.....	9	.....	54	.....	30	weekly
Int. United Steam Engineers, No. 473	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	fortnightly
Steel and Copper Plate Printers, No. 6	.....	.....	.....	.....	42½	42½	4½	4½	47	47	none	weekly
Stereotypers' Union, No. 50	18 50	all org	42	.....	40	.....	5	.....	45	.....	none	week. or fort.
Journ. Stonecutters' Association	19 35	19 35	44	44	40	40	4	4	44	44	125	fortnightly
Stonemason's Union, No. 14	22 88	21 60	52	40	40	45	4	9	44	54	124	fortnightly
Bro. of Railway Trainmen, No. 129	21 50	21 50	35	35	50	50	10	10	60	60	26	monthly
Bro. of Railway Trainmen, No. 185	18 00	18 00	30	30	50	50	10	10	60	60	uncer.	monthly
Typographical Int. Union, No. 102	18 00	18 00	37	37	42½	42½	5	5	47½	47½	none	week. or fort.
Canadian Typographical Union, No. 1	19 00	.....	39	.....	42½	.....	5	.....	47½	.....	none	week. or fort.

OWEN SOUND:												
Canadian Assoc. Steam Engineers, No. 25	16 00	14 00	26¼	23	50	50	10	10	60	60	84	fortnightly
Int. Moulders' Union, No. 413	17 50	17 50	32	32	50	50	5	5	55	55	50	fortnightly
Journ. Stonecutters' Association	21 60	16 50	45	27½	40	50	8	10	48	60	100	weekly
PALMERSTON:												
Order of Railway Conductors, No. 492	30 00	30 00	39	39	50	50	10	10	70	70	none	monthly
Bro. of Loco. Firemen and Enginemen, No. 181	15 00	15 00	mile.	basis	mile.	basis	.....	.....	.....	.....	none	monthly
PARRY SOUND:												
Int. Assoc. of Machinists, No. 518	16 00	16 00	30	30	47½	47½	7	7	54½	54½	none	monthly
Maintenance of Way Employes, No. 447	11 40	11 40	19	19	50	50	10	10	60	60	none	monthly
Bro. of Railway Trainmen, No. 759	mile.	basis	.....	.....	mile.	basis	.....	.....	.....	.....	none	monthly
PEMBROKE:												
Maintenance of Way Empl., No. 221	10 20	7 20	17	12	50	50	10	10	60	60	.....	monthly
PETERBOROUGH:												
Int. Brewery Workers' Union, No. 304	12 50	.....	22½	.....	47½	.....	8	.....	55½	.....	none	weekly
Bricklayers', Masons' and P. Union, No. 17	19 20	19 20	40	36	40	45	8	9	48	54	150	fortnightly
United Bro. Carpenters and Joiners, No. 672	15 00	13 50	27½	25	45	45	9	9	54	54	80	weekly
Carpet Weavers' Assoc., No. 663	12 00	12 00	22	22	50	50	5	5	55	55	30	fortnightly
Fed. Assoc. of Letter Carriers, No. 22	13 50	13 50	25	25	45	45	9	9	54	54	none	fortnightly
Int. Assoc. of Machinists, No. 286	15 00	15 00	27½	27½	50	50	5	5	55	55	none	fortnightly
Maintenance of Way Empl., No. 211	10 20	10 20	17	17	50	50	10	10	60	60	none	monthly
Int. Moulders' Union, No. 191	16 50	.....	27½	.....	50	.....	7	.....	57	.....	30	week. or fort.
Pattern Makers' League of N. A.	17 00	.....	30	.....	50	.....	5	.....	55	.....	.....	fortnightly
Journ. Tailors' Union of America, No. 23 (Male)	12 00	all org	20	.....	62½	.....	12½	.....	75	.....	.....	weekly
Journ. Tailors' Union of America, No. 23 (Female)	7 00	all org	15	.....	62½	.....	12½	.....	75	.....	.....	weekly
Typographical Union, No. 248	14 00	.....	29⅙	.....	40	.....	8	.....	48	.....	none	weekly
PORCUPINE:												
Western Federation of Miners	20 00	.....	32	.....	45	.....	9	.....	54	.....	180	monthly
PORT ARTHUR:												
Bartenders' Int. League, No. 757	15 00	all org	33	.....	40	.....	6	.....	46	.....	.....	monthly
Amal. Society Carpenters and Joiners, No. 865	24 00	.....	40	.....	50	.....	10	.....	60	.....	.....	fortnightly
United Bro. Carpenters and Joiners, No. 285	24 00	18 75	40	31¼	50	50	10	10	60	60	100	fortnightly
Electrical Workers, No. 367	21 00	21 00	39½	39½	50	50	4	4	54	54	none	fortnightly
Canadian Ass. Stationary Engineers, No. 29	20 00	20 00	33⅓	33⅓	50	50	10	10	60	60	.....	monthly
Fed. Labour Union, No. 14135	13 50	13 50	22½	22½	50	50	10	10	60	60	none	fortnightly
Int. Longshoremen's Ass., No. 319 (Coal)	12 00	12 00	25	25	varies	.....	.....	.....	.....	.....	125	monthly
Int. Assoc. of Machinists	22 50	15 00	45	30	45	45	5	5	50	50	none	week. or mon.
Plumbers', etc., Int. Union, No. 378	24 00	21 00	50	.....	40	45	8	9	48	54	50	fortnightly
Journ. Stonecutters' Association	28 80	.....	60	.....	40	.....	8	.....	48	.....	150	fortnightly
Typographical Union, No. 575	20 72	20 72	43⅛	43⅛	40	40	8	8	48	48	none	fortnightly
PRESTON:												
Int. Moulders' Union, No. 314	18 00	18 00	30	30	50	50	9	9	59	59	50	weekly
Polishers, Buffers, etc., No. 27	.....	.....	.....	.....	50	.....	7	.....	57	.....	.....	weekly
Stove Mounters' Int. Union, No. 11	14 00	12 50	25	22½	50	50	5	5	55	55	36	weekly

Table showing average wages and hours of Labour, etc.—*Continued.*

Location and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average days idle.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
	$ c.	$ c.	c.	c.								
RAINY RIVER:												
Bro. of Railway Carmen, No. 436	14 00	14 00	26	26	50	50	7	7	57	57	14	monthly
Order of Railway Conductors, No. 30	mile	age ba	sis	.....	mile	age ba	sis	.....	.....	.....	.....	monthly
Bro. of Loco. Firemen and Enginemen, No. 750	18 00	18 00	30	30	.....	.....	.....	.....	.....	.....	.....	monthly
RICHMOND HILL:												
Order of Railway Telegraphers	16 00	16 00	20	20	60	60	12	12	72	72	none	monthly
ST. CATHARINES:												
Barbers' Int. Union, No. 1	13 00	.....	17½	.....	60	.....	16	.....	72	.....	.....	weekly
Brewery Workers' Int. Union, No. 305	11 00	.....	20	.....	45	.....	9	.....	54	.....	.....	weekly
Bricklayers' and Masons' Int. Union, No. 4	24 00	24 00	48	48	45	45	9	9	54	54	85	weekly
Amal. Soc. Carpenters and Joiners, No. 867	17 50	.....	35	25	45	.....	5	.....	50	.....	40	weekly
Unit. Bro. Carpenters and Joiners, No. 38	17 50	16 50	35	27½	45	55	5	5	50	60	15	weekly
Cigar Makers' Int. Union, No. 140	12 00	12 00	25	25	40	40	8	8	48	48	none	weekly
Fed. Assoc. of Letter Carriers, No. 17	12 00	12 00	22½	22½	45	45	9	9	54	54	none	fortnightly
Int. Assoc. of Machinists, No. 268	17 00	17 00	30	30	50	50	8½	8½	58½	58½	6	fortnightly
Int. Moulders' Union, No. 385	18 00	18 00	30	30	50	50	5	5	55	55	.....	week. or fort.
Bro. of Painters, Decorators, etc., No. 407	17 50	16 16	35	32½	45	45	5	5	50	50	80	weekly
Plumbers and Steam Fitters' Union, No. 244	15 00	.....	30	.....	45	.....	5	.....	50	.....	14	weekly
Polishers, Buffers, etc., No. 97 (Polishers)	16 50	16 50	28½	28½	50	50	7½	7½	57½	57½	30	week. or fort.
Polishers, Buffers, etc., No. 97 (Buffers)	15 00	15 00	26	26	50	50	7½	7½	57½	57½	30	week. or fort.
Journ. Tailors' Union, (Male)	13 00	13 00	21	21	50	50	10	10	60	60	60	weekly
Journ. Tailors' Union, (Female)	10 00	10 00	17	17	50	50	10	10	60	60	60	weekly
Typographical Union No. 416	15 00	all org	31½	.....	42½	.....	5½	.....	48	.....	none	weekly
ST. MARY'S:												
Journ. Stonecutters' Association	21 60	all org	45	.....	40	.....	8	.....	48	.....	75	fortnightly
ST. THOMAS:												
Boiler Makers' Int. Bro., No. 413	17 60	17 60	35	29	45	50	5	10	50	60	none	monthly
Bro. of Boilermakers and Helpers of Canada, No. 5	11 00	9 75	20	18	45	50	9	9	54	54	.....	monthly
Bricklayers' and Masons' Union, No. 8	23 60	23 60	42	39	45	50	9	10	54	60	75	fortnightly
Cigar Makers' Int. Union, No. 420	12 50	6 00	28	14	40	45	4½	9	44½	54	.....	weekly

Order of Railway Conductors, No. 13	25 00	25 00	36	36	.....	.....	.....	.....	.....	.....	none	monthly
Bro. of Loco. Engineers, No. 529	23 40	23 40	39	39	50	50	10	10	60	60	30	monthly
Bro. of Loco. Engineers, No. 661	.....	.....	40	40	sub	ject to	call	.....	.....	.....	.....	monthly
Amal. Society of Engineers, No. 713	18 60	15 60	34½	29	45	45	9	9	54	54	.....	monthly
Bro. of Loco. Firemen and Enginemen, No. 5	mil'ge	basis	30¾	30¾	mil'ge	basis	.....	.....	.....	.....	none	monthly
Gas Workers' Union Fed. Lab., No. 13,144	13 00	13 00	24	24	40	40	8	8	48	48	none	fortnightly
Int. Assoc. of Machinists, No. 294	18 60	15 00	34½	28	45	45	9	9	54	54	30	monthly
Machinists' Helpers, etc., No. 12906	10 00	10 00	19	19	45	45	9	9	54	54	5	monthly
Maintenance of Way Employes, No. 291	10 00	10 00	16½	16½	50	50	10	10	60	60	.....	monthly
Int. Ass. Pipe Fitters, etc., No. 107	15 00	15 00	25	25	50	50	10	10	60	60	20	monthly
Int. United Pressmen, etc., No. 129	14 00	all org	29	.....	40	.....	8	.....	48	.....	none	weekly
Bro. of Railway Signalmen of America	.....	.....	.....	.....	50	50	10	10	60	60	.....	monthly
Journ. Tailors' Union of America, No. 141 (Male)	12 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	60	weekly
Journ. Tailors' Union of America, No. 141 (Female)	7 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	60	weekly
Bro. of Railway Trainmen, No. 47 (Conductors)	21 75	21 75	.....	.....	mil'ge	basis	.....	.....	.....	.....	unertn	monthly
Bro. of Railway Trainmen, No. 47 (Brakemen)	14 50	14 50	.....	.....	mil'ge	basis	.....	.....	.....	.....	unertn	monthly
Typographical Union, No. 459	16 00	all org	33⅓	.....	40	.....	8	.....	48	.....	none	weekly
SARNIA:												
Journ. Barbers' Int. Union, No. 467	14 00	12 00	19⅔	14⅓	56	64	15	17	71	81	none	weekly
Bricklayers', Masons, etc., Union, No. 23	27 00	.....	50	.....	45	.....	9	.....	54	.....	90	week. or fort.
Bro. of Railway Carmen, No. 295	11 40	11 40	19	19	50	50	10	10	60	60	none	monthly
Order of Railway Conductors, No. 189	25 00	25 00	.....	.....	when	called	.....	.....	.....	.....	none	monthly
Bro. of Loco. Engineers, No. 240	32 50	32 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	monthly
Bro. of Loco. Firemen and Enginemen, No. 221	18 00	18 00	.....	.....	mil'ge	basis	.....	.....	.....	.....	none	monthly
Fed. Assoc. of Letter Carriers, No. 31	13 50	13 50	25	25	40	40	8	8	48	48	12	fortnightly
Int. Longshoremen's Association	18 00	9 00	30	15	50	50	10	10	60	60	90	end of job
Bro. of Railway Trainmen, No. 227	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	monthly
SAULT STE. MARIE:												
Amal. Soc. Carpenters and Joiners, No. 869	21 00	21 00	35	35	50	50	10	10	60	60	50	fortnightly
Lathers' Int. Union, No. 191	24 00	24 00	40	40	50	50	10	10	60	60	90	fortnightly
Bro. of Loco. Firemen and Enginemen, No. 606	25 00	25 00	mil'ge	basis	mil'ge	basis	.....	.....	.....	.....	none	monthly
Maintenance of Way Employes, No. 269	10 50	10 50	24½	24½	50	50	10	10	60	60	none	monthly
Int. Moulders' Union, No. 391	19 00	18 00	32	30	50	50	10	10	60	60	none	monthly
Plumbers' and Steam Fitters' Union, No. 414	22 50	.....	45	.....	45	.....	5	.....	50	.....	.....	weekly
SCHREIBER:												
Bro. of Loco. Firemen and Enginemen, No. 387	26 25	26 25	31	31	50	50	10	10	60	60	none	monthly
Int. Assoc. of Machinists, No. 69	23 40	.....	39	.....	50	.....	10	.....	60	.....	60	monthly
Maintenance of Way Employes, No. 264	13 30	13 30	19	19	50	50	10	10	60	60	none	monthly
SILVER CENTRE:												
Western Federation of Miners, No. 148	18 00	18 00	35	35	45	45	8	8	53	53	100	fortnightly
SIMCOE:												
Maintenance of Way Employes, No. 217	14 40	14 40	24	24	50	50	10	10	60	60	none	monthly

Table showing average wages and hours of Labour, etc.—*Continued.*

Location and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average days idle.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
	$ c.	$ c.	c.	c.								
SMITH'S FALLS:												
Bricklayers', Masons' and P. Union, No. 21	24 30	all org	45	.....	45	.....	9	.....	54	.....	150	fortnightly
Bro. of Loco. Engineers, No. 381	35 00	35 00	39	39	when	called	.....	.....	.....	.....	30	monthly
Maintenance of Way Employes, No. 136	14 40	11 40	24	19	50	50	10	10	60	60	none	monthly
Int. Moulders' Union, No. 201	17 10	17 10	28½	28½	47½	47½	9½	9½	57	57	20	fortnightly
STEVENSVILLE:												
Order of Railway Telegraphers	15 00	15 00	20	20	60	60	12	12	72	72	5	monthly
STRATFORD:												
Journ. Barbers', etc., Union, No. 136	12 00	.....	17	17	60	.....	15	.....	75	.....	.....	weekly
Boilermakers', etc., Union, No. 297	12 65	12 65	23	23	50	50	5	5	55	55	10	monthly
Bricklayers', Masons' and P. Union, No. 24	24 00	15 00	45	25	45	50	9	10	54	60	150	wk. or fort.
Cigar Makers' Union, No. 424	11 00	all org	23	.....	40	.....	7½	.....	47½	.....	varies	weekly
Order of Railway Conductors, No. 15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	monthly
Bro. of Loco. Engineers, No. 188	20 00	20 00	by trip	.....	.....	.....	.....	.....	.....	.....	varies	monthly
Amal. Society of Engineers, No. 579	.....	.....	.....	.....	45	45	5	5	50	50	none	monthly
Bro. of Loco. Firemen and Enginemen, No. 38	mile	age ba	sis		20	20	.....	.....	.....	.....	varies	monthly
Int. Asso. of Machinists, No. 103	17 00	12 20	31	24	50	50	5	5	55	55	none	monthly
Bro. of Railway Trainmen, No. 8	16 00	16 00	25	25	varies	.....	.....	.....	.....	.....	none	monthly
Typographical Union, No. 139	13 40	11 40	27½	21	40	45	8	9	48	54	none	weekly
SUDBURY:												
Bartenders' Int. League, No. 237	12 00	12 00	20	20	85	85	13	13	98	98	none	monthly
Amal. Society Carpenters and Joiners, No. 9	18 00	18 00	30	30	50	50	8	8	58	58	75	fortnightly
Journ. Tailors' Union, No. 226 (Male)	16 00	.....	25	.....	50	.....	10	.....	60	.....	.....	fortnightly
Journ Tailors' Union, No. 226 (Female)	9 00	.....	15	.....	50	.....	10	.....	60	.....	.....	fortnightly
THOROLD:												
United Bro. Carpenters and Joiners, No. 1677	20 00	15 00	37½	25	45	50	5	10	50	60	30	weekly
TORONTO:												
Journ. Barbers' Int. Union, No. 517	12 50	11 25	18	16⅔	55	55	14	14	69	69	75	weekly
Bartenders' Union and Ben. Society, No. 280	18 00	16 00	26	20	60	69	9	10	69	79	none	weekly
Int. Alli. Billposters, etc., No. 40	15 00	.....	30	.....	45	.....	5	.....	50	.....	.....	weekly

Bro. of Boilermakers, etc., of Canada, No. 1	16 00	16 00	29	29	50	50	5	5	55	55	7	fortnightly
Int. Bro. of Boiler Makers, etc., No. 548	18 00	18 00	32	32	47½	47½	5	5	52½	52½	5	fort or mont.
Int. Bro. of Bookbinders, No. 28	18 00	18 00	39	39	43¾	43¾	4¼	4¼	48	48	12	weekly
Boot and Shoe Workers' Int. Union, No. 233	.....	.....	.....	.....	45	45	4	4	49	49	.....	weekly
Int. Union of Brewery Workers, No. 317 (Maltsters)	14 50	all org	25	.....	50	.....	10	.....	60	.....	.....	weekly
Bricklayers', Masons' and P. Union, No. 2 (Bricklayers)	23 00	23 00	52½	42	40	50	4	5	44	55	50	fortnightly
Bricklayers' Masons' and P. Union, No. 26 (Stonemason)	23 00	18 70	52½	42½	40	40	4	4	44	44	90	fortnightly
Bridge and Struct. Iron Workers, No. 4	17 50	10 50	35	21	45	45	5	5	50	50	150	fortnightly
Int. Broom and Whisk Makers, No. 55	10 50	10 50	21½	21½	42½	42½	4½	4½	47	47	42	weekly
Builders' Labourers' Union, No. 1	12 32	11 00	28	25	40	40	4	4	44	44	100	fortnightly
Bro. of Railway Carmen, No. 258	11 00	11 00	22	22	45	45	5	5	50	50	none	monthly
Amal. Soc. Carpenters and Joiners, 1st Branch, No. 798	17 60	16 50	40	30	40	50	4	5	44	55	30	wk. or fort.
Amal. Soc. Carpenters and Joiners, 2nd Branch, No. 873	17 60	16 20	40	30	40	45	4	9	44	54	15	fortnightly
Amal. Soc. Carpenters and Joiners, 3rd Branch, No. 874	17 60	.....	40	.....	40	.....	4	.....	44	.....	50	fortnightly
Amal Soc. Carpenters and Joiners, 4th Branch, No. 801	16 28	less	37	less	40	none	4	.....	44	.....	14	wk. or fort.
Amal. Soc. Carpenters and Joiners, 5th Branch, No. 802	.....	.....	.....	.....	40	40	4	4	44	44	84	fortnightly
Amal. Soc. Carpenters' and Joiners, 6th Branch, No. 877	17 60	less	40	less	40	40	4	4	44	44	77	fortnightly
United Bro. Carpenters and Joiners, No. 27	17 60	16 50	40	30	40	55	4	5	44	55	.....	fortnightly
United Bro. Carpenters and Joiners, No. 1553	16 28	.....	37	.....	40	.....	4	.....	44	.....	.....	fortnightly
United Bro. Carpenters and Joiners, No. 1,799	17 60	19 00	40	37	40	47½	4	5	44	52½	20	fortnightly
United Bro. Carpenters and Joiners, No. 1,820 (Cabinet-makers)	15 12	11 37	31½	22½	43	50	5	5	48	55	.....	wk. or fort.
Carriage, Wagon and Auto Workmen, No. 85	12 00	12 00	22½	20	45	55	5	5	50	60	.....	weekly
Cigar Makers' Int. Union, No. 27	12 00	all org	28	.....	40	.....	4	.....	44	.....	21	weekly
Order of Railway Conductors, No. 17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	monthly
Order of Railway Conductors, No. 345	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	monthly
Int. Bro. Electrical Workers, No. 114 (Wiremen)	17 60	15 40	40	35	40	40	4	4	44	44	30	wk. or fort.
Int. Bro. Electrical Workers, No. 353 (Linemen)	17 33	17 33	33⅓	33⅓	45	45	7	7	52	52	30	weekly
Amal. Society of Engineers, No. 689	16 50	16 50	30	30	50	50	5	5	55	55	.....	wk., f. or m.
Hoisting and Portable Engineers, No. 356	24 00	19 50	40	32½	50	50	10	10	60	60	30	fortnightly
Bro. of Locomotive Engineers, No. 70	varies	.....	42	42	varies	.....	.....	.....	.....	.....	.....	monthly
Bro. of Locomotive Engineers, No. 295	25 00	25 00	35	35	Irreg.	.....	.....	.....	.....	.....	none	monthly
Int. Union of Steam Engineers, No. 152	14 00	14 00	25	25	50	50	5	5	55	55	none	weekly
Bro. of Locomotive Firemen and Enginemen, No. 67	varies	.....	.....	.....	varies	.....	.....	.....	.....	.....	none	monthly
Bro. of Locomotive Firemen and Enginemen, No. 262	30 00	30 00	.....	.....	varies	.....	.....	.....	.....	.....	none	monthly
Int. Bro. of Stationary Firemen, No. 800	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fur Workers' Union, No. 14,187 (Male)	16 50	16 50	33⅓	33⅓	45	45	5	5	50	50	28	weekly
Fur Workers' Union, No. 14,187 (Female)	9 00	9 00	17½	17½	45	45	5	5	50	50	28	weekly
Fur Cutters and Workers' Union, No. 14,202	16 00	16 00	32¾	32¼	45	45	4	4	49	49	.....	weekly
United Garment Workers of America, No. 83 (Ladies' Cutters)	14 00	.....	28	.....	45	.....	4	.....	49	.....	35	weekly
United Garment Workers of America, No. 185 (Cutters)	16 00	14 00	32	27	45	48	4	4	49	52	15	weekly
United Garment Workers of America, No. 202 (Female)	9 20	9 20	16¾	16¾	45	45	4	4	49	49	50	weekly
Gas Workers' Fed. Union, No. 1	15 00	15 00	31	31	40	40	8	8	48	48	.....	weekly
Glass Bottle Blowers' Association, No. 66	30 00	30 00	55	55	44	44	8	8	52	52	90	fortnightly

Table showing average wages and hours of labour, etc.—*Continued.*

Locality and Title of Organization.	Average wages per week.		Average wages per hour.		Hours of labour first 5 days.		Hours on Saturday.		Total hours per week.		Average idle days.	Period of wage payments.
	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.	Organized.	Unorganized.		
TORONTO.—*Continued.*												
Amal. Glass Workers' Association, No. 20	15 00	15 00	30	30	45	45	5	5	50	50	25	weekly
Granite Cutters' Int. Association	16 50	.....	37½	.....	40	.....	4	.....	44	.....	.....	fortnightly
Bro. Leather Workers on Horse Goods, No. 98	10 00	10 00	18	18	50	50	5	5	55	55	.....	fortnightly
Lithographers' Int. Association, No. 12	18 00	18 00	37½	37½	43¾	43¾	4¼	4¼	48	48	12	weekly
Int. Longshoremen's Association, No. 646	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	180	weekly
Int. Association of Machinists, No. 235	15 00	15 00	30	27½	45	50	5	5	50	55	uncer.	wk. or fort.
Mailers' Union, No. 5	18 00	14 00	40	30	35	40	7	8	42	48	none	weekly
Int. Moulders' Union, No. 28	17 00	17 00	34	31	45	50	5	5	50	55	20	wk. or fort.
Int. Moulders' Union, No. 207 (Brass)	18 50	11 75	34	21¼	50	50	5	5	55	55	none	wk. or fort.
Moving Picture Machine Operators, No. 173	21 50	12 00	50	24	35	40	8	10	43	50	none	weekly
Musical Protective Association, No. 149	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	weekly
Painters, Paperhangers, etc., No. 3	15 40	15 40	35	30	40	45	4	6½	44	51½	30	fortnightly
Painters, Paperhangers, etc., No. 737	15 40	13 20	35	30	40	40	4	4	44	44	60	wk. or fort.
Pattern Makers' Association	21 50	18 00	41½	35	47½	47½	4½	4½	52	52	30	fortnightly
Int. Photo Engravers' Union, No. 35	20 00	20 00	43	43	42½	42½	4	4	46½	46½	none	weekly
Operative Plasterers' Int. Association, No. 48	22 00	20 00	50	45	40	40	4	4	44	44	50	fortnightly
Plumbers', Gas Fitters, etc., Union, No. 46	17 60	13 20	40	30	40	40	4	4	44	44	100	wk. or fort.
Polishers, Platers, etc., No. 21	.....	.....	.....	.....	47½	.....	5	.....	52½	.....	20	wk. or fort.
Printers' Pressmen's Union, No. 1 (Web)	18 00	all org	37½	.....	40	.....	8	.....	48	.....	none	weekly
Amal. Sheet Metal Workers' Int. Alliance, No. 30	16 50	13 75	35	25	42½	50	4½	5	47	55	none	weekly
Slate and Tile Roofers Union, No. 39	20 00	.....	40	.....	45	.....	5	.....	50	.....	.....	weekly
Int. Association Steam Fitters, etc., No. 78	18 50	12 10	42½	27½	40	40	4	4	44	44	60	fortnightly
Stereotypers' and Electrotypers' Union, No. 21	19 00	all org	40	.....	43	.....	5	.....	48	.....	18	weekly
Journ. Stone Cutters' Association	22 00	15 40	50	35	40	40	4	4	44	44	135	fortnightly
Amal. Association Street and Electric Ry. Employees. No. 113	14 10	14 10	23½	23½	5	50	10	10	60	60	none	fortnightly
Journ. Tailors' Union, No. 132 (Male)	13 00	13 00	25	25	50	50	10	10	60	60	50	weekly
Journ. Tailors' Union, No. 132 (Female)	9 00	9 00	18	18	50	50	10	10	60	60	50	weekly

Journ. Tailors' Union, No. 156 (Male)	13 00	.....	22	.....	piece	work	.....	.....	.....	.....	48	fortnightly
Journ. Tailors' Union, No. 156 (Female)	9 00	.....	22	.....	piece	work	.....	.....	.....	.....	48	fortnightly
Team Owners' Association	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Int. Bro. of Teamsters, No. 457 (Coal)	12 00	10 50	22	21	45	45	5	5	50	50	none	weekly
Int. Bro. of Teamsters, No. 458 (Milk)	13 00	13 00	20	20	45	45	11	11	64	64	none	wk. or fort.
Commercial Telegraphers of America, No. 6	.....	.....	.....	.....	41¼	41¼	8¼	8¼	50	50	.....	monthly
Tile Setters' Union, No. 37	19 00	19 00	45	45	40	40	4	4	44	44	.....	fortnightly
Bro. of Railway Trainmen, No. 255	27 50	27 50	30	30	.....	.....	.....	.....	90	90	varies	monthly
Bro. of Railway Trainmen, No. 322	20 00	20 00	30	30	.....	.....	.....	.....	.....	.....	varies	monthly
Travellers' Goods and Leather Novelties, No. 5	13 00	11 00	25	23	47½	47½	5	5	52½	52½	15	fortnightly
Typographical Union, No. 91	18 00	.....	38	.....	44	50	4	5	48	55	none	weekly
Upholsterers' Int. Union, No. 30	16 00	12 75	33	26	45	45	4	4	49	49	14	wk. or fort.
Waiters' Union, No. 300	6 00	6 00	9	9	60	60	10	10	70	70	90	w. f. or m.
WEBBWOOD:												
Bro. of Maintenance of Way Employees, No. 70	15 00	.....	25	.....	50	.....	10	.....	60	.....	.....	monthly
WELLAND:												
Amal. Society Carpenters and Joiners, No. 809	19 00	16 50	35	27½	45	50	9	10	54	60	50	weekly
United Bro. Carpenters and Joiners, No. 969	16 20	16 20	30	27	45	50	9	10	54	60	60	weekly
Int. Association of Machinists, No. 131	16 00	.....	28¾	.....	50	.....	10	.....	60	.....	.....	fortnightly
Int. Moulders' Union, No. 472	19 00	.....	31¼	.....	50	.....	7½	.....	57½	.....	.....	weekly
WEST PORT:												
Bro. of Railway Carmen, No. 437	18 00	18 00	26	26	50	50	10	10	70	70	none	monthly
WINDSOR:												
Journ. Barbers' Int. Union, No. 451	12 50	11 30	16	14	62½	62½	16¼	16¼	78¾	78¾	26	weekly
Bricklayers', Masons', etc., Int. Union, No. 6	27 50	27 50	55	55	45	45	5	5	50	50	90	fortnightly
Order of Railway Conductors, No. 494	18 00	18 00	30	30	50	50	10	10	60	60	none	monthly
Nat. Association Marine Engineers of Canada	32 00	32 00	38	38	60	60	12	12	84	84	.....	monthly
Bro. of Locomotive Firemen and Enginemen, No. 421	20 00	20 00	25	25	60	60	12	12	72	72	.....	monthly
United Garment Workers of America, No. 190 (Male)	12 00	all org	25	.....	43¾	.....	4¼	.....	48	.....	21	weekly
United Garment Workers of America, No. 190 (Female)	11 12	all org	23	.....	43¾	.....	4¼	.....	48	.....	21	weekly
Painters, Decorators, etc., of America, No. 629	14 00	14 00	30	30	40	40	7	7	47	47	60	weekly
Operative Plasterers' Int. Union, No. 345	25 00	.....	50	.....	45	.....	5	.....	50	.....	85	fortnightly
United Association Plumbers, etc., No. 552	23 75	23 75	47½	47½	45	45	5	5	50	50	38	weekly
Sheet Metal Workers' Int. Alliance, No. 320	18 00	.....	33¼	.....	45	.....	7	.....	52	.....	50	weekly
Switchmen's Union of North America, No. 184	23 27	23 27	35	35	55	55	11½	11½	66½	66½	.....	monthly
Bro. of Railway Trainmen, No. 316	22 00	22 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	monthly
Typographical Union, No. 553	14 00	.....	29¼	.....	43½	.....	4½	.....	48	.....	.....	weekly
WOODSTOCK:												
Bricklayers' and Masons' Union, No. 22	24 00	all org	45	.....	45	.....	9	.....	54	.....	150	fortnightly
Moulders' Int. Union No. 249	18 00	15 00	30	25½	50	50	9	9	59	59	50	weekly
Journ. Tailors' Union of America, No. 33 (Male)	14 00	.....	25	.....	45	.....	9	.....	54	.....	12	fortnightly
Journ. Tailors' Union of America, No. 33 (Female)	8 00	.....	15	.....	45	.....	9	.....	54	.....	12	fortnightly
Typographical Union, No. 317	19 00	.....	40	.....	40	.....	6½	.....	46½	.....	none	weekly

DIRECTORY OF CENTRAL LABOUR ORGANIZATIONS IN ONTARIO.

Name of Organization.	Date Organized.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
BERLIN:				
Twin City Trades and Labour Council	1900	Louis B. Albricht	Box 665, Berlin	2nd & 4th Monds.
BRANTFORD:				
Trades and Labour Council	1886	H. J. Symons	115 Cayuga Street	1st & 2nd Weds.
BROCKVILLE:				
Trades and Labour Council	1900	Fred. Clutterbuck	6 Halliday St.	Every Friday.
FORT WILLIAM:				
Trades and Labour Council	1907	Geo. W. Howitt	Box 224	2nd & 4th Weds.
GALT:				
Galt and Preston Trades and Labour Council		Arthur L. Philp	Box 1010	
GUELPH:				
Trades and Labour Council	1898	Freeman Felker	114 Northumberland Street	2nd & 4th Frids.
HAMILTON:				
Trades and Labour Council	1888	W. R. Rollo	P. O. Box 323	1st & 3rd Frids.
Building Trades Council		W. Brown	Arthur Ave.	2nd & 4th Tues.
Garment Workers' District Council	1898	C. Bambrick	421 John St. North	2nd Wednesday.
KINGSTON:				
Trades and Labour Council		W. J. Driscoll	Box 27	
LONDON:				
Trades and Labour Council	1902	H. B. Archer	455 St. James St.	1st & 3rd Weds.
OTTAWA:				
Allied Trades and Labour Association	1897	Wm. Lodge	21 Creighton St.	1st & 3rd Thurs.
National Trades and Labour Council	1907	J. O'Heare	39 Cambridge St.	1st & 3rd Thurs.
Building Trades Council		Jos. Cinqmars	13 Poplar St.	
Allied Printing Trades Council		W. C. Blount	375 Lyon St.	
PETERBOROUGH:				
Trades and Labour Council		Ch. Hummacott	267 McDonnel Ave.	
PORT ARTHUR:				
Trades and Labour Council		S. Wilson	Trade and Labour Hall	
ST. CATHARINES:				
Trades and Labour Council		Leo. T. Coyle	138 Church Street	1st & 3rd Weds.
ST. THOMAS:				
Trades and Labour Council		Jas. D. Ballantine	39 Flora Street	
STRATFORD:				
Trades and Labour Council	1900	Fred. J. Todd	Box 329, Stratford	2nd & 4th Frids.
TORONTO:				
Toronto District Labour Council	1881	J. H. H. Ballantyne	Labour Temple	1st & 3rd Thurs.
Allied Printing Trades Council		W. A. Vickery	51 Alexander St.	2nd Tuesday.
Building Trades Council	1905	W. Bambridge	64 Pears Ave.	2nd & 4th Monds.
United Brotherhood Carpenters and Joiners District Council		M. C. Clark	Labour Temple	2nd & 4th Monds.

DIRECTORY OF CENTRAL LABOUR ORGANIZATIONS IN ONTARIO —*Continued.*

Name of Organization.	Date Organized.	Name of Secretary.	Secretary's Address.	Nights of Meeting.
TORONTO.—*Con.*				
Managing Committee Amalgamated Society Carpenters and Joiners		Geo. Thomson	223 Lippincott St...	Alternate Weds.
Painters' District Council		Frank Evans	9 Suburban Place...	4th Friday.
Garment Workers' Council		H. A. Keller	59 Grange Ave.	
Theatrical Council		W. D. Shank	49 Edwin Ave.	
Metal Trades Council		Jos. M. Helliker	191 Bolton Ave.	2nd & 4th Tues.
Iron Moulders' Board of Conference		J. H. Barnett	19 Rolyat St.	
Label Trades Department		D. W. Kennedy	58 Hook Ave,	
WINDSOR:				
Trades and Labour Council		F. J. Hughes	c-o Standard Printing Co.	1st & 3rd Weds.

ONTARIO INDUSTRIAL STATISTICS.

It is uphill work persuading the manufacturers of the Province to fill in and return the schedules that are sent to them for the purpose of obtaining information as to our industrial progress, but still there is a continual increase year by year, and there seems to be a growing conviction that the statistics thus obtained are treated as absolutely confidential as far as the identity of the firms and companies is concerned. Out of the 868 returns that have been received 49 do not give sufficient material for tabulation in our second series, so that these tables contain 819 establishments as compared with 707 last year, and 642, 610, 536, 384, and 153, in the five previous years. These tables show that 57,991 persons were employed, with aggregate wages amounting to $28,022,416, and product to $139,990,138; that the aggregate number of days in operation was 229,473, the annual average wages was $495.10, and the average daily wage was $1.74. The whole of the industrial statistics show continued progress.

RETURNS IN DETAIL

LUMBER MANUFACTURERS,

Office No.	Capital employed, including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
1	200,000	170	1,000,000	.....	25	6,000	20,000	.....	.....	600	.....
2	940,902	152	403,050	9	.....	1,189	11,027	713	300,199	247	.....
3	200,000	160	275,000	no	no	664	8,163	.....	.....	140	.....
4	150,000	180	100,000	no	no	500	2,000	5,600	.....	40	.....
5	60,000	300	40,000	no	no	150	300	500	.....	68	.....
6	150,000	190	225,000	yes	.....	608	5,070	.....	.....	100	.....
7	108,725	180	59,586	.....	yes	.....	1,631	6,000	3,185	35	.....
8	200,000	250	150,000	no	no	475	2,000	.....	.....	70	.....
9	426,354	139	251,817	.....	8	500	5,071	16,645	50,000	120	.....
10	350,000	150	175,000	5	.....	350	7,300	1,500	.....	65	.....
11	71,150	300	112,439	9	.....	850	1,029	1,500	.....	50	.....
12	10,000	300	8,000	.....	25	125	150	.....	.....	8	.....
13	30,000	260	20,000	no	no	92	260	.....	1,000	20	.....
14	50,000	300	100,000	10	.....	200	500	2,000	.....	12	.....
15	12,000	....	.....	.....	.....	115	.....	.....	.....	.....	.....
16	225,000	50	25,000	.....	yes	210	2,350	.....	.....	48	.....
17	250,000	220	350,000	no	no	3,200	2,625	.....	.....	250	.....
18	150,000	136	172,000	.....	15	92	6,900	.....	.....	115	.....
19	80,000	305	411,712	5	.....	477	.....	4,000	.....	74	.....
20	20,000	300	.....	.....	.....	270	4,600	.....	7,541	10	.....
21	.....	151	131,000	.....	.....	1,322	3,243	5,585	1,137	90	.....
22	120,000	296	62,461	4	.....	1,228	1,993	.....	12,805	40	.....
23	9,000	200	4,000	.....	5	35	.....	100	.....	7	.....
24	2,299,600	160	1,100,000	no	no	.....	25,000	.....	.....	403	.....
25	20,000	300	16,000	.....	.....	102	.....	1,800	.....	27	.....
26	20,000	300	.....	yes	.....	125	125	.....	.....	5	.....
27	100,000	300	95,000	100	.....	300	2,603	.....	.....	25	.....
28	3,000	100	1,500	no	no	5	.....	.....	.....	4	.....
29	20,000	150	20,000	10	.....	55	275	.....	.....	15	.....
30	60,000	150	30,000	no	no	256	786	.....	500	18	.....
31	14,000	130	11,000	no	no	110	.....	.....	.....	12	.....
32	25,000	300	30,000	10	.....	.....	250	500	1,000	45	.....
33	300,000	312	250,000	no	no	539	4,984	1,500	15,000	250	.....
34	40,000	100	18,750	no	no	223	260	.....	.....	20	.....
35	500,000	175	345,000	.....	33⅓	1,500	4,800	1,500	.....	150	.....
36	35,000	150	4,500	no	no	205	50	400	.....	8	.....
37	500,000	264	673,721	yes	.....	1,763	7,457	.....	.....	173	.....
38	2,000	100	1,000	no	no	31	51	.....	.....	3	.....
39	300,000	150	200,000	17½	.....	700	22,000	2,500	.....	112	.....
40	200,000	300	225,000	no	no	670	6,300	.....	.....	100	.....
41	6,000	150	.....	no	no	79	86	.....	.....	9	.....
42	130,000	300	143,180	.....	.....	883	1,224	.....	.....	62	.....
43	184,498	300	.....	.....	.....	1,043	1,980	.....	6,840	42	.....
44	489,000	140	4,528	25	.....	64	.....	.....	.....	4	.....
45	10,000	180	20,000	50	.....	50	150	.....	800	25	.....
46	500	30	.....	10	.....	.....	.....	.....	.....	.....	.....
47	100,000	160	550,000	.....	yes	225	5,000	15,000	.....	300	.....
48	.....	200	.....	.....	.....	85	.....	.....	.....	5	.....
49	25,000	140	50,000	.....	20	420	152	.....	250	20	.....
50	20,000	300	20,500	.....	20	99	200	500	300	5	.....
51	200,000	300	200,000	no	no	857	2,228	2,000	18,800	35	.....
52	10,000	70	.....	.....	10	134	215	300	.....	18	.....
53	25,000	260	40,000	no	no	110	260	.....	1,000	20	.....
54	7,000	124	8,469	150	.....	26	.....	500	.....	10	.....
55	150,000	300	120,000	40	.....	180	300	.....	.....	160	.....
56	150,000	312	60,000	10	.....	.....	.....	3,000	.....	300	.....

FROM MANUFACTURERS.

SAWMILLS.—TABLE No. 1.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
300,000	.....	16 67	average	.....	.....	20	....	15,000	7½	....	7½	.....	1
77,672	.....	17 00	9 50	.....	.....	5	1	12,260	no	no	.....	.....	2
22,000	.....	27 00	10 80	.....	.....	4	1	6,983	no	no	.....	.....	3
10,000	.....	8 33	average	.....	.....	2	....	2,000	10	....	10	.....	4
20,000	.....	15 00	8 25	.....	.....	1	1	710	10	....	10	.....	5
34,390	.....	42 00	12 00	.....	.....	2	....	2,170	15	....	15	.....	6
14,376	.....	30 00	12 75	.....	.....	1	....	1,000	no	no	.....	.....	7
27,500	.....	23 25	10 50	.....	.....	.....	1	600	10	.....	.....	.....	8
50,287	.....	18 42	average	.....	.....	2	....	1,800	5	....	5	5	9
18,200	.....	10 75	average	.....	.....	4	1	3,500	no	no	.....	.....	10
26,000	.....	15 00	9 00	.....	.....	4	1	7,340	10	....	10	10	11
4,000	.....	12 00	9 00	.....	.....	.....	.....	.....	no	no	.....	.....	12
5,500	.....	15 00	9 60	.....	.....	.....	.....	.....	10	....	10	10	13
5.000	.....	12 00	6 00	.....	.....	.....	.....	.....	10	....	10	10	14
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15
5,000	.....	16 00	average	.....	.....	1	....	780	.....	.....	.....	.....	16
52,000	.....	12 75	10 50	.....	.....	10	....	12.000	5	....	5	5	17
23,000	.....	16 50	12 00	.....	.....	1	....	1,000	10	....	10	.....	18
29,450	.....	18 00	10 50	.....	.....	6	2	4,449	5	....	5	5	19
6,240	.....	22 50	12 00	.....	.....	2	....	2,400	.....	.....	.....	.....	20
28,737	.....	21 00	10 50	.....	.....	2	....	2,800	5	.....	.....	.....	21
28,440	.....	16 50	10 50	.....	.....	6	2	10,055	.....	.....	.....	.....	22
1,500	.....	15 00	9 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	23
234,000	.....	39 00	12 45	.....	.....	28	2	30.840	.....	.....	.....	.....	24
3,176	.....	12 00	8 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	25
4,000	.....	18 00	12 00	.....	.....	.....	.....	.....	no	no	.....	.....	26
15,000	.....	22 50	16 50	.....	.....	1	....	300	yes	....	.....	.....	27
600	.....	.....	6 00	.....	.....	.....	.....	.....	no	no	.....	.....	28
3,000	.....	.....	9 00	.....	.....	2	....	1,500	no	no	.....	.....	29
9,000	.....	18 00	9 00	.....	.....	3	....	2.000	5	....	5	.....	30
3,000	.....	10 00	average	.....	.....	.....	.....	.....	no	no	.....	.....	31
18,000	.....	15 00	10 50	.....	.....	.....	.....	.....	10	.....	.....	.....	32
150,000	.....	24 00	10 50	.....	.....	5	....	6,000	17	....	17	.....	33
4,986	.....	15 00	10 50	.....	.....	.....	1	208	no	no	.....	.....	34
42,000	.....	24 50	10 50	.....	.....	12	....	14.400	no	no	.....	.....	35
3,000	.....	15 00	10 50	.....	.....	.....	.....	.....	no	no	.....	.....	36
109,764	.....	22 50	10 50	.....	.....	.....	.....	.....	no	no	.....	.....	37
300	.....	.....	6 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	38
48,000	.....	33 00	12 75	.....	.....	5	....	4.000	2	....	2	.....	39
48,000	.....	24 75	10 20	.....	.....	5	1	5,500	no	no	.....	.....	40
1,500	.....	13 50	9 00	.....	.....	.....	.....	.....	17	....	17	17	41
28,625	.....	19 50	13 50	.....	.....	4	1	6,000	.....	.....	.....	.....	42
27,024	.....	19 50	6 90	.....	.....	3	2	4,980	no	no	.....	.....	43
1,015	.....	12 00	10 50	.....	.....	.....	.....	.....	no	no	.....	.....	44
4.000	.....	9 60	7 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	45
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	46
95,000	.....	33 00	13 50	.....	.....	.....	.....	.....	no	no	.....	.....	47
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	48
4,000	.....	10 50	9 00	.....	.....	.....	.....	.....	no	no	.....	.....	49
1,700	.....	8 10	average	.....	.....	.....	.....	.....	no	no	.....	.....	50
22,000	.....	24 00	13 50	.....	.....	7	1	5,400	no	no	.....	.....	51
2,700	.....	24 00	12 00	.....	.....	.....	1	100	no	no	.....	.....	52
6,000	.....	15 00	9 90	.....	.....	1	....	1,200	10	....	10	10	53
2,000	.....	10 00	average	.....	.....	.....	.....	.....	no	no	.....	.....	54
45,000	.....	11 00	average	.....	.....	5	....	6,000	10	....	10	10	55
28,000	.....	27 00	13 50	.....	.....	2	....	2.800	10	....	10	10	56

RETURNS IN DETAIL

LUMBER MANUFACTURERS.

Office No.	Capital employed, including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
57	40,000	243	6,829	.....	yes	366	385	.....	.....	7	.....
58	100,000	130	65,000	no	no	260	1,555	.....	.....	48	.....
59	1,500,000	300	514,000	10	.....	2,755	11,645	2,650	42,405	300	.....
60	35,000	90	25,000	.....	25	152	300	.....	.....	20	.....
61	2,000	30	1,000	.....	40	20	.....	75	.....	8	.....
62	10,000	300	10,000	no	no	80	50	.....	.....	15	.....
63	10,000	100	11,500	50	.....	60	75	.....	.....	12	.....
64	75,000	150	.....	.....	.....	600	1,000	.....	.....	.....	.....
65	5,500	200	7,500	no	no	50	65	.....	.....	6	.....
66	2,000	200	15,000	no	no	.....	56	.....	.....	4	.....
67	53,071	258	4,750	10	.....	22	120	250	.....	7	.....
68	14,000	116	18,000	no	no	55	100	.....	.....	15	.....
69	15,000	275	15,000	no	no	95	120	.....	350	7	.....

PLANING MILLS, SASH AND DOOR

70	100,000	313	150,000	20	.....	490	1,800	2,000	2,900	100	.....
71	61,055	300	48,000	7	.....	1,026	627	2,500	400	43	.....
72	75,000	300	125,000	no	no	713	2,655	.....	.....	80	.....
73	30,000	250	50,000	.....	.....	.....	125	3,000	.....	28	.....
74	30,000	300	20,000	no	no	200	.....	1,000	.....	25	.....
75	10,000	250	10,000	.....	.....	37	60	.....	.....	4	.....
76	75,000	300	344,055	10	.....	1,228	1,993	.....	298,107	52	.....
77	75,000	300	80,000	no	no	498	672	1,000	733	50	.....
78	300,000	300	310,000	no	no	1,937	3,263	.....	.....	160	.....
79	80,000	250	46,000	30	.....	450	750	600	.....	45	.....
80	.....	300	210,000	13	.....	1,400	1,550	22,000	.....	65	.....
81	6,000	104	3,935	.....	7½	55	.....	.....	100	8	.....
82	10,000	280	8,000	no	no	34	109	.....	.....	4	.....
83	120,000	300	.....	40	.....	680	1,190	3,000	.....	45	.....
84	150,000	300	200,000	yes	.....	600	1,200	.....	.....	40	.....
85	145,000	270	140,000	25	.....	136	1,300	4,000	2,000	65	.....
86	4,500	38	1,700	.....	10	11	73	.....	.....	9	.....
87	70,000	300	115,000	7	.....	300	500	.....	.....	50	.....
88	2,000	50	.....	.....	25	30	.....	.....	.....	4	.....
89	70,000	312	60,000	no	no	196	800	.....	.....	35	.....
90	52,660	270	30,226	.....	15	90	586	129	3,068	12	.....
91	10,000	250	3,000	.....	5	110	200	200	.....	6	.....
92	60,000	290	125,000	8	.....	502	1,850	.....	2,689	65	.....
93	35,000	100	5,000	.....	10	100	350	.....	.....	12	.....
94	300,000	300	56,000	40	.....	973	1,800	3,600	39,000	60	.....
95	9,700	290	44,000	.....	.....	145	221	250	450	11	.....
96	35,000	310	25,000	10	.....	200	.....	1,000	.....	15	.....
97	20,000	300	45,000	5	.....	155	350	.....	.....	10	.....
98	75,000	305	103,400	15	.....	735	1,000	.....	1,200	30	.....
99	110,000	300	100,000	5	.....	400	1,800	6,000	1,500	50	.....
100	60,000	305	94,800	25	.....	570	465	3,000	.....	14	.....
101	8,000	240	10,863	no	no	22	.....	300	.....	9	.....
102	50,000	310	.....	yes	.....	138	599	.....	5,000	30	.....
103	100,000	305	100,000	no	no	245	807	3,500	.....	63	.....
104	100,000	300	100,000	no	no	300	808	3,533	.....	58	.....

FROM MANUFACTURERS.

SAWMILLS—TABLE NO. 1 (Continued).

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c	$ c.	$ c.			$	%	%	%	%	
3,000	.....	10 50	9 00	.....	.....	1	....	550	yes	....	.....	.....	57
13,123	.....	18 75	10 50	.....	.....	....	1	360	10	....	10	.....	58
124,066	.....	8 27	average	.....	.....	4	1	6,270	no	no	.....	.....	59
5,100	.....	16 50	10 50	.....	.....	2	....	1,300	10	....	10	.....	60
346	.....	10 50	8 10	.....	.....	.....	.....	.....	no	no	.....	.....	61
6,300	.....	10 00	8 00	.....	.....	1	....	400	10	....	10	.....	62
1,680	.....	18 00	11 00	.....	.....	.....	.....	.....	5	....	5	.....	63
.....	.....	19 50	12 00	.....	.....	3	2	5,500	.....	yes	yes	.....	64
1,800	.....	.....	9 00	.....	.....	.....	.....	.....	no	no	.....	.....	65
1,300	.....	13 00	12 00	.....	.....	.....	.....	.....	20	....	20	20	66
1,436	.....	10 50	7 50	.....	.....	.....	.....	.....	8	....	.....	.....	67
2,500	.....	21 00	10 50	.....	.....	.....	.....	.....	no	no	.....	.....	68
2,400	.....	8 00	average	.....	.....	.....	.....	.....	15	....	15	.....	69

FACTORIES, ETC.—TABLE NO 2.

36,000	.....	7 00	average	.....	.....	8	1	6,000	8	....	.....	.....	70
14,864	.....	15 00	8 00	.....	.....	4	1	3,000	10	....	10	10	71
34,000	.....	19 50	11 25	.....	.....	3	....	2,650	.....	....	.....	.....	72
12,000	.....	13 50	9 00	.....	.....	.....	.....	.....	3	....	.....	.....	73
8,000	.....	15 00	9 00	.....	.....	3	....	2,500	5	....	5	5	74
2,000	.....	15 00	10 50	.....	.....	.....	.....	.....	.....	....	.....	.....	75
28,440	.....	13 91	11 30	.....	.....	6	2	10,055	no	no	.....	.....	76
38,973	.....	15 60	average	.....	.....	7	1	6,774	8	....	8	.....	77
80,000	.....	18 00	11 50	.....	.....	12	1	12,500	10	....	10	.....	78
24,000	.....	13 20	9 60	.....	.....	3	....	1,900	no	no	.....	.....	79
26,000	.....	17 25	10 75	.....	.....	4	....	6,300	10	....	10	10	80
936	.....	7 00	average	.....	.....	.....	.....	.....	20	....	.....	.....	81
1,500	.....	10 00	7 50	.....	.....	1	....	600	no	no	.....	.....	82
10,125	.....	4 50	average	.....	.....	2	....	1,800	10	....	10	10	83
28,000	.....	14 00	average	.....	.....	3	1	5,000	no	no	.....	.....	84
24,200	.....	15 00	9 60	.....	.....	.....	2	850	.....	....	.....	.....	85
900	.....	12 00	8 25	.....	.....	.....	.....	.....	15	....	15	.....	86
25,500	.....	14 40	11 40	.....	.....	2	1	3,000	.....	....	.....	.....	87
200	.....	6 00	average	.....	.....	.....	.....	.....	25	....	.....	.....	88
23,286	.....	18 00	12 00	.....	.....	2	....	4,500	2	....	2	.....	89
4,996	.....	13 50	8 50	.....	.....	2	1	3,417	.....	7	7	.....	90
3,640	.....	14 80	average	.....	.....	.....	.....	.....	2	....	2	.....	91
21,278	.....	18 00	9 75	.....	.....	2	1	3,000	.....	....	.....	.....	92
2,000	.....	18 00	8 25	.....	.....	3	1	2,000	10	....	10	10	93
33,378	.....	16 50	11 00	.....	.....	9	3	10,500	10	....	10	10	94
5,353	.....	21 00	10 80	.....	.....	2	....	1,612	no	no	.....	.....	95
7,485	.....	12 00	8 10	.....	.....	.....	.....	.....	2½	....	2½	.....	96
5,375	.....	15 75	11 25	.....	.....	1	....	.....	no	no	.....	.....	97
35,000	.....	22 50	16 50	.....	.....	7	....	9,900	no	no	.....	.....	98
25,000	.....	21 00	9 00	.....	.....	3	1	4,000	7	....	7	7	99
8,736	.....	20 00	12 00	.....	.....	1	1	.....	5	....	5	5	100
3,000	.....	10 50	average	.....	.....	1	....	600	.....	....	.....	.....	101
.....	.....	14 25	9 00	.....	.....	4	....	3,700	yes	....	.....	.....	102
22,070	.....	14 25	6 00	.....	.....	2	....	1,700	7½	....	7½	.....	103
22,070	.....	8 25	verage	.....	.....	2	....	1,500	7½	....	7½	.....	104

RETURNS IN DETAIL

Woodworking Factories, Specialties

Office No.	Capital employed, including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
105	30,000	300	72,000	10	.....	275	710	700	15,100	35	.....
106	50,000	300	120,000	10	.....	87	365	5,000	.....	40	.....
107	27,500	48	41,958	.....	15	60	600	.....	.....	38	.....
108	70,000	290	150,000	23	.....	580	582	.....	.....	55	25
109	5,600	305	6,690	.....	15	73	201	.....	.....	6	1
110	452,976	300	312,472	14⅓	.....	300	720	4,500	68,800	176	24
111	23,000	200	28,637	no	no	.....	364	.....	5,000	16	.....
112	82,800	301	60,567	20	.....	317	1,077	3,836	30,554	20	10
113	30,600	290	33,638	10	.....	62	418	450	2,160	36	4
114	25,000	300	20,000	no	no	160	600	.....	.....	10	1
115	75,000	300	108,000	.....	5	403	1,252	.....	2,796	42	.....
116	10,000	275	15,000	no	no	93	60	600	.....	4	.....
117	5,000	307	10,800	50	.....	235	44	500	.....	5	.....
118	216,104	294	190,000	5	.....	640	1,100	3,000	5,000	180	8
119	5,000	280	15,000	yes	.....	.....	132	600	.....	7	.....
120	20,000	300	50,000	no	no	35	600	1,600	.....	45	5
121	9,124	305	20,709	no	no	32	192	756	.....	28	12
122	92,581	280	.....	no	no	117	503	.....	.....	40	.....
123	15,000	300	65,000	no	no	90	725	.....	1,200	32	.....
124	10,000	200	7,000	25	.....	20	30	.....	.....	16	.....
125	6,000	290	7,500	no	no	71	59	.....	3,233	4	1
126	50,000	225	40,000	25	.....	200	1,450	15,000	.....	35	.....
127	50,000	300	95,000	.....	5	300	1,676	.....	.....	140	.....
128	140,000	295	135,000	40	.....	560	2,200	.....	.....	125	.....
129	25,000	279	72,600	30	.....	360	120	3,000	1,500	13	10
130	3,000	300	5,000	no	no	.....	2,080	.....	.....	5	.....
131	10,000	300	18,000	15	.....	115	125	1,000	.....	18	.....
132	90,000	300	85,000	.....	.....	104	1,010	.....	.....	48	.....
133	85,600	300	90,000	15	.....	316	1,884	1,600	9,330	80	.....
134	25,000	300	100,000	.....	10	31	266	.....	.....	31	7
135	25,000	250	14,000	.....	25	50	500	1,500	.....	30	.....
136	5,000	300	5,000	no	no	95	46	.....	.....	.....	.....
137	3,000	313	.....	no	no	25	25	.....	.....	2	.....
138	2,500	300	2,500	5	.....	20	1,900	.....	.....	3	.....
139	3,000	304	8,057	60	.....	6	26	175	2,129	9	.....
140	3,000	300	6,000	¼	.....	75	100	2,000	25	10	.....
141	43,379	300	70,000	.....	.....	226	1,228	.....	.....	48	.....
142	30,000	310	25,000	10	.....	175	300	.....	.....	25	.....
143	49,000	300	110,000	10	.....	250	.....	.....	.....	80	15
144	50,000	300	32,000	no	no	350	300	.....	.....	10	.....
145	12,900	313	15,000	50	.....	114	242	.....	.....	15	.....
146	.....	300	.....	.....	.....	.....	.....	.....	.....	5	.....
147	100,000	300	105,023	yes	.....	315	1,870	.....	.....	100	15
148	50,000	225	50,000	51	.....	130	550	1,500	30,000	25	.....

Furniture Manufacturers; Bank, Store

149	200,000	300	100,000	5	.....	100	450	100,000	.....	80	.....
150	59,100	300	200,000	10	.....	600	700	10,000	.....	120	2
151	67,000	285	88,000	no	no	300	1,300	.....	.....	52	3
152	55,000	300	119,000	50	.....	200	800	7,000	.....	65	4
153	336,715	300	218,022	6	.....	1,522	2,925	.....	22,997	135	2
154	24,000	295	35,000	30	.....	58	225	5,400	.....	32	.....
155	30,000	300	68,000	no	no	138	812	4,000	34,823	49	.....
156	177,844	300	145,000	30	.....	316	228	.....	.....	70	.....
157	100,000	300	110,000	no	no	375	1,200	.....	.....	80	.....

FROM MANUFACTURERS.

IN WOODENWARE.—TABLE No. 3.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
16,293	.....	15 00	11 00	.....	.....	....	2	900	10	....	10	10	105
15,000	.....	16 50	13 50	.....	.....	4	1	4,000	no	no	.....	.....	106
7,253	.....	21 00	12 75	.....	.....	1	....	1,200	10	....	10	.....	107
19,000	6,200	15 00	10 50	7 50	4 50	4	4	6,000	10	....	10	10	108
3,010	96	10 90	6 00	.....	2 00	.....	.....	.....	10	....	.....	.....	109
56,000	7,600	20 00	9 00	10 00	5 00	11	11	12,752	5	....	10	5	110
9,600	.....	21 00	12 00	.....	.....	.....	1	260	no	no	.....	.....	111
12,410	3,500	13 50	.....	7 20	.....	3	....	6,600	yes	....	.....	.....	112
12,540	740	12 00	7 50	.....	3 60	2	1	2,600	8	....	8	.....	113
8,000	400	13 50	10 50	6 00	.....	....	1	500	10	....	10	.....	114
18,300	.....	10 50	9 00	.....	.....	.....	2	4,200	6	....	.....	.....	115
3,000	.....	16 30	average	.....	.....	1	1	1,500	10	....	10	10	116
3,075	.....	21 00	.....	.....	.....	3	....	2,496	20	....	20	.....	117
61,000	2,550	16 50	9 00	12 00	6 00	7	2	9,000	5	....	5	.....	118
3,100	.....	12 00	6 30	.....	.....	.....	.....	.....	10	....	10	.....	119
18,000	both	13 50	10 50	.....	8 11	....	1	520	15	....	15	15	120
11,000	both	12 00	9 60	.....	.....	.....	.....	.....	5	....	.....	.....	121
.....	.....	15 00	9 00	.....	.....	.....	1	300	yes	....	.....	.....	122
11,000	.....	14 00	8 00	.....	.....	2	....	1,200	.....	....	.....	.....	123
3,000	.....	9 00	7 50	.....	.....	.....	.....	.....	20	....	20	.....	124
1,722	270	15 00	6 50	.....	6 00	.....	.....	.....	no	no	.....	.....	125
9,000	.....	10 50	9 00	.....	.....	2	....	1,800	.....	....	.....	.....	126
24,000	.....	22 50	12 00	.....	.....	2	1	3,500	10	....	10	.....	127
39,700	.....	15 75	9 00	.....	.....	5	....	4,200	12½	....	12½	12½	128
5,000	3,000	13 00	9 00	.....	5 00	2	....	3,800	10	....	10	10	129
3,000	.....	19 50	.....	.....	.....	.....	.....	.....	no	no	.....	.....	130
7,000	.....	15 00	8 00	.....	.....	.....	.....	.....	no	no	.....	.....	131
18,769	.....	17 50	average	.....	.....	1	....	2,800	6	....	.....	.....	132
33,391	.....	12 75	9 00	.....	.....	3	2	4,587	10	....	10	10	133
13,250	1,750	8 55	average	5 01	av'ge	5	....	4,400	no	no	.....	.....	134
10,000	.....	18 00	10 50	.....	.....	1	....	900	10	....	10	.....	135
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	.....	.....	136
1,200	.....	12 00	average	.....	.....	.....	.....	.....	yes	....	.....	.....	137
1,400	.....	12 00	4 00	.....	.....	.....	.....	.....	yes	....	.....	.....	138
3,975	.....	21 00	6 00	.....	.....	1	1	850	yes	....	.....	.....	139
2,500	.....	5 00	average	.....	.....	.....	.....	.....	5	....	5	.....	140
29,177	.....	10 50	7 50	.....	.....	8	2	10,415	.....	....	.....	.....	141
8,000	.....	18 00	9 00	.....	.....	1	....	1,500	10	....	10	.....	142
31,000	both	12 00	9 00	6 00	.....	.....	.....	.....	no	no	.....	.....	143
50,000	.....	15 00	10 50	.....	.....	1	3	2,400	no	no	.....	.....	144
5,200	.....	13 50	9 00	.....	.....	2	....	1,200	14	....	.....	.....	145
.....	.....	12 00	9 00	.....	.....	.....	.....	.....	10	....	.....	.....	146
46,542	both	15 00	9 00	6 00	.....	1	1	720	yes	....	.....	.....	147
12,000	.....	10 30	average	.....	.....	3	....	3,000	32	....	.....	.....	148

AND OFFICE FITTINGS.—TABLE No. 4.

40,000	.....	12 00	10 50	.....	.....	3	1	15,000	7	....	7	.....	149
45,000	400	13 50	8 10	5 00	.....	4	2	52,000	5	....	5	.....	150
19,000	1,000	13 50	9 00	6 00	.....	5	2	8,900	10	....	10	.....	151
23,500	1,500	7 50	average	for	all	4	1	5,000	5	....	5	5	152
61,258	.....	13 80	12 00	.....	.....	3	2	9,435	.....	....	.....	.....	153
14,362	.....	13 50	8 25	.....	.....	1	....	1,000	7½	....	7½	.....	154
20,000	.....	10 50	9 00	.....	.....	2	....	1,700	no	no	.....	.....	155
27,228	.....	13 50	8 25	.....	.....	4	1	3,500	10	....	10	.....	156
36,000	.....	.....	9 00	.....	.....	2	....	1,000	20	....	.....	.....	157

RETURNS IN DETAIL

FURNITURE MANUFACTURERS; BANK, STORE

Office No.	Capital employed, including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
158	75,000	305	100,000	40	.....	324	506	20,000	.....	50	.....
159	200,000	300	300,000	10	.....	990	3,145	1,000	5,000	100	2
160	30,741	307	31,592	67½	.....	98	493	513	2,860	19	15
161	100,000	300	100,000	10	.....	600	1,400	.....	.....	65	.....
162	80,436	300	62,807	10	.....	159	296	10,553	25,711	36	.....
163	35,000	305	46,000	33⅓	.....	32	600	8,000	1,000	32	.....
164	325,000	290	460,000	30	.....	100	672	.....	49,500	300	.....
165	500,000	300	775,000	31	.....	1,632	380	.....	100,000	70	.....
166	50,000	300	31,000	no	no	125	630	.....	.....	28	.....
167	850,000	306	720,000	4	.....	2,500	3,150	35,000	.....	450	.....
168	116,854	306	129,955	13	.....	745	807	.....	12,125	75	.....
169	65,000	300	75,000	7	.....	.....	245	118	.....	35	.....
170	80,000	300	81,821	16	.....	185	210	2,710	6,528	67	.....
171	160,000	296	227,929	10	.....	432	521	832	.....	155	4
172	85,592	301	62,761	5	.....	120	1,987	2,369	1,363	46	.....
						CARRIAGES AND OTHER VEHICLES AND PARTS					
173	50,000	300	70,000	15	.....	180	.....	.....	.....	46	.....
174	100,000	300	100,000	15	.....	362	2,300	15,000	.....	65	.....
175	75,000	300	120,000	50	.....	700	900	3,500	.....	65	7
176	100,000	300	110,000	5	.....	400	835	4,400	4,500	68	.....
177	93,491	300	100,000	12	.....	325	1,347	5,000	37,000	40	.....
178	269,340	245	91,156	.....	.....	.....	546	.....	.....	86	.....
179	400,000	300	324,000	6¼	.....	427	4,863	110,000	6,000	275	30
180	110,000	300	60,000	20	.....	450	200	.....	12,000	45	.....
181	17,000	305	40,000	90	.....	65	350	2,000	.....	25	1
182	462,438	283	370,974	11	.....	1,188	1,262	5,000	.....	276	28
183	40,000	305	75,000	20	.....	90	1,000	1,500	.....	55	.....
184	10,000	305	33,000	no	no	32	188	.....	.....	11	.....
185	70,000	300	52,464	no	no	187	372	.....	1,677	42	.....
186	.....	300	121,000	.....	.....	936	1,615	.....	.....	51	.....
187	210,000	300	185,000	10	.....	2,000	2,500	.....	.....	75	12
188	170,810	293	264,347	20	.....	922	941	.....	.....	149	1
189	60,000	300	50,000	no	no	900	3,500	.....	.....	20	5
190	55,000	300	59,500	33	.....	64	750	.....	8,028	48	.....
191	30,000	305	18,000	10	.....	200	160	.....	.....	12	5
192	75,000	280	50,000	10	.....	100	700	300	500	30	.....
193	200,000	300	325,000	70	.....	.....	.....	.....	.....	220	.....
194	25,000	300	42,500	no	no	365	300	1,200	.....	22	2
195	196,937	308	162,318	25	.....	557	512	3,243	39,483	50	.....
196	35,000	300	35,000	no	no	75	500	.....	.....	18	.....
197	100,000	300	183,865	.....	.....	239	802	.....	13,634	70	1
198	78,000	300	150,000	10	.....	500	1,500	1,500	6,500	60	.....
199	25,000	250	50,000	no	no	125	600	900	.....	18	.....
200	250,000	290	298,735	.....	5	1,410	2,346	5,000	23,500	150	.....
201	90,000	313	188,614	.....	10½	1,010	873	1,595	13,318	75	4
202	688,000	310	534,000	60	.....	900	1,100	8,000	32,000	200	6
203	67,000	300	56,000	20	.....	.....	720	2,800	.....	30	.....
204	100,000	300	100,000	no	no	350	550	1,000	8,500	50	.....
205	40,000	310	35,000	no	no	150	30	800	.....	6	.....
206	50,000	300	48,071	.....	.....	221	1,129	.....	7,932	15	1
207	391,000	313	270,000	17	.....	1,955	3,022	.....	41,300	130	5
208	200,000	300	822,000	20	.....	500	1,750	10,000	.....	320	10
209	14,000	305	30,000	33⅓	.....	125	140	.....	.....	12	1
210	26,195	300	23,141	15	.....	254	249	.....	5,292	10	.....
211	74,486	305	22,150	no	no	631	219	550	.....	10	.....
212	15,000	312	7,000	10	.....	125	40	.....	.....	3	.....

FROM MANUFACTURERS.

AND OFFICE FITTINGS.—TABLE No. 4.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
20,450	.....	12 00	.....	.....	.....	2	3	3,200	10	....	10	.....	158
55,000	1,100	18 00	12 00	11 00	.....	15	5	25,700	yes	....	.....	.....	159
8,585	2,420	15 00	7 50	6 50	4 00	7	3	5,106	no	no	.....	.....	160
27,000	.....	14 40	9 90	.....	.....	4	....	5,000	4	....	4	4	161
16,964	.....	12 00	9 00	.....	.....	1	1	1,950	10	....	10	10	162
15,000	.....	12 75	9 75	.....	.....	1	1	.....	10	....	10	.....	163
135,000	.....	13 50	9 45	.....	.....	20	....	32,250	10	....	.....	10	164
41,648	.....	16 20	10 20	.....	.....	14	1	14,366	2	....	2	2	165
12,500	.....	12 00	9 00	.....	.....	1	2	2,000	5	....	5	.....	166
200,656	.....	12 30	9 45	.....	.....	17	3	25,950	10	....	10	.....	167
41,261	.....	16 50	9 00	.....	.....	4	1	6,000	7	....	7	.....	168
24,833	.....	15 00	10 50	.....	.....	4	....	6,465	5	....	5	.....	169
22,719	.....	8 42	average	.....	.....	3	....	3,092	yes	....	.....	.....	170
71,095	762	10 68	7 50	5 22	.....	4	3	6,433	yes	....	.....	.....	171
18,122	.....	12 30	9 00	.....	.....	1	1	1,635	11	....	11	.....	172
THEREOF AND MOTORS.—TABLE No. 5.													
19,160	.....	15 00	9 00	.....	.....	2	2	3,300	yes	....	.....	.....	173
25,000	.....	15 00	9 00	.....	.....	3	2	3,500	10	....	.....	.....	174
28,000	2,100	16 50	10 80	8 00	5 00	3	1	4,000	10	....	10	10	175
28,000	.....	12 00	9 00	.....	.....	3	1	4,200	8	....	8	8	176
32,000	.....	15 00	9 60	.....	.....	7	2	9,000	10	....	10	10	177
31,061	.....	18 00	8 10	.....	.....	4	3	4,569	.....	....	.....	.....	178
147,200	8,800	19 80	10 80	9 00	4 80	15	8	13,500	5	....	5	5	179
22,000	.....	15 00	10 50	.....	.....	3	1	4,600	10	....	10	.....	180
10,000	600	19 80	15 00	12 00	.....	1	1	1,900	10	....	10	.....	181
113,506	5,302	15 00	8 10	6 00	3 50	7	6	19,501	13½	....	15	6	182
25,000	.....	12 75	8 25	.....	.....	1	1	1,300	5	....	5	.....	183
7,500	.....	15 00	12 00	.....	.....	1	....	700	no	no	.....	.....	184
16,800	.....	8 10	average	.....	.....	5	1	5,900	10	....	10	10	185
35,000	.....	13 50	10 50	.....	.....	.....	.....	.....	.....	....	.....	.....	186
30,000	2,500	15 00	10 50	10 00	5 00	2	3	6,000	no	no	.....	.....	187
75,919	351	14 25	10 50	7 80	.....	4	2	7,626	yes	....	.....	.....	188
16,800	1,680	18 00	10 50	12 00	7 20	4	2	5,320	no	no	.....	.....	189
24,560	.....	13 50	10 50	.....	.....	2	....	2,000	5	....	5	.....	190
3,000	700	15 00	8 25	9 00	6 00	.....	.....	.....	10	....	10	.....	191
12,000	.....	15 00	10 20	.....	.....	1	1	1,500	no	no	.....	.....	192
.....	.....	13 80	10 50	.....	.....	5	4	.....	10	....	10	.....	193
22,000	570	14 25	10 50	.....	5 70	1	1	1,000	10	....	.....	.....	194
34,313	.....	20 00	10 50	.....	.....	2	1	3,840	no	no	.....	.....	195
7,000	.....	10 50	8 50	.....	.....	1	....	400	5	....	5	5	196
23,885	165	18 00	10 50	.....	3 30	2	....	3,300	10	....	10	10	197
28,000	.....	16 50	9 75	.....	.....	4	2	8,500	10	....	10	10	198
8,600	.....	13 50	10 20	.....	.....	1	1	2,200	.....	....	.....	.....	199
77,281	.....	24 75	10 80	.....	.....	4	1	7,528	no	no	.....	.....	200
72,076	1,508	18 50	average	7 25	aver.	5	1	6,100	7½	....	7½	.....	201
111,600	1,900	21 00	9 00	10 50	6 00	11	4	22,200	yes	....	.....	.....	202
20,250	.....	16 50	10 50	.....	.....	1	....	3,000	no	no	.....	.....	203
28,500	.....	15 00	9 90	.....	.....	1	2	2,200	no	no	.....	.....	204
5,000	.....	21 00	15 00	.....	.....	1	1	3,000	10	....	10	10	205
8,103	416	10 80	average	8 03	.....	1	....	2,000	.....	....	.....	.....	206
51,164	both	15 00	10 50	7 80	4 50	8	4	13,200	17	....	17	.....	207
168,000	3,200	15 00	9 00	9 00	6 00	11	5	17,400	10	....	10	10	208
15,640	240	25 55	average	.....	4 73	1	1	.....	yes	....	.....	.....	209
5,669	.....	15 00	9 00	.....	.....	3	1	3,049	.....	....	.....	.....	210
5,950	.....	13 50	9 00	.....	.....	1	....	.....	no	no	.....	.....	211
1,872	.....	12 00	.....	.....	.....	.....	.....	.....	.....	....	.....	.....	212

RETURNS IN DETAIL

CARRIAGES AND OTHER VEHICLES AND PARTS

Office No.	Capital employed, including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
213	195,100	308	600,000	20	.....	3,062	8,215	53,967	80,847	365	1
214	225,000	300	80,000	⅛	.....	.....	1,575	2,000	.....	65	5
215	1,034,472	300	2,420,788	125	.....	.....	.....	232,615	93,656	350	.....
216	20,000	300	24,000	10	.....	150	200	500	.....	12	.....
217	15,000	300	40,000	50	.....	62	.....	.....	.....	25	.....
218	10,000	300	12,000	no	no	40	5,000	200	.....	5	.....

AGRICULTURAL IMPLEMENTS, FARMING HAND

219	300,000	298	100,000	5	.....	280	1,601	.....	.....	100	1
220	169,769	307	93,514	15	.....	323	400	5,000	.....	23	.....
221	.....	300	1,000,000	15	.....	2,094	6,300	7,814	57,000	350	.....
222	170,000	300	35,000	31	.....	206	1,052	.....	12,661	30	.....
223	5,000	225	7,000	no	no	100	93	.....	.....	4	.....
224	260,000	305	224,048	47	.....	221	435	37,500	.....	75	.....
225	100,000	280	200,000	yes	.....	100	800	10,000	.....	55	.....
226	96,000	300	250,000	25	.....	1,200	2,400	.....	.....	80	both
227	25,000	305	15,000	no	no	175	150	.....	.....	6	.....
228	10,000	305	12,000	yes	.....	150	100	400	.....	10	.....
229	50,000	305	30,000	10	.....	125	476	2,000	.....	10	10
230	275,000	280	200,000	no	no	1,400	2,400	.....	.....	30	16
231	10,000	200	12,000	.....	.....	124	54	.....	.....	3	1
232	50,000	300	.....	no	no	581	648	.....	62,506	14	.....
233	200,000	300	175,000	no	no	1,235	1,422	4,000	1,608	70	1
234	45,000	305	32,200	20	.....	32	330	.....	.....	12	.....

PIANO, ORGAN AND MUSICAL INSTRUMENT

235	125,000	300	160,000	no	no	1,149	300	.....	.....	65	.....
236	100,000	300	234,070	21	.....	422	692	1,430	100,441	110	2
237	60,000	300	60,000	no	no	350	230	.....	.....	26	.....
238	1,000	295	4,000	no	no	.....	17	.....	.....	2	.....
239	100,000	300	61,737	.....	yes	393	630	.....	2,575	25	.....

WOOD-PULP FACTORIES, PAPER MILLS, STATIONERY

240	300,000	262	527,467	yes	.....	1,535	1,224	.....	.....	160	40
241	40,000	303	80,000	no	no	275	300	1,000	2,000	6	20
242	20,000	305	44,500	yes	.....	.....	210	3,010	.....	10	40
243	3,000	310	17,500	.....	20	23	11	.....	.....	7	.....
244	160,000	301	114,818	75	.....	179	665	6,229	64,398	23	.....
245	.....	305	11,500	5	.....	42	175	.....	.....	5	18
246	40,000	305	60,000	.....	10	170	350	.....	.....	20	25
247	21,000	286	30,000	8	.....	80	160	.....	.....	4	17
248	75,000	300	65,000	50	.....	230	100	500	800	15	10
249	72,000	300	156,000	30	.....	950	540	.....	.....	42	105
250	4,000	300	10,000	15	.....	10	48	.....	.....	3	7
251	50,000	300	60,000	50	.....	55	150	2,000	.....	8	4
252	14,603	305	38,875	4	.....	83	90	.....	2,015	10	2
253	140,000	310	216,000	2	.....	475	1,000	.....	.....	55	5
254	12,000	305	30,000	no	no	70	175	.....	.....	4	18
255	100,000	305	95,000	15	.....	200	700	10,000	.....	15	20
256	30,000	300	30,000	10	.....	59	262	1,200	.....	7	3
257	100,000	312	50,000	10	.....	541	775	1,000	.....	10	18

FROM MANUFACTURERS.

THEREOF AND MOTORS. TABLE NO. 5.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c	$ c.	$ c.	$ c.			$	%	%	%	%	
186,724	1,112	14 70	9 60	21 08	.....	12	3	12,283	5	....	5	5	213
24,512	1,475	15 00	10 50	.....	6 00	4	1	4,000	10	....	10	10	214
98,919	.....	18 00	12 00	.....	.....	20	5	31,825	5	....	5	5	215
6,000	.....	15 00	9 00	.....	.....	....	....	.....	10	....	10	.....	216
18,000	.....	16 50	9 75	.....	.....	3	....	3,540	10	....	10	.....	217
2,500	.....	11 00	.....	.....	.....	....	....	.....	.....	....	.....	.....	218
TOOLS AND DAIRY MACHINERY.—TABLE NO. 6.													
25,000	480	33 33	average	9 60	.....	3	....	4,400	no	no	.....	.....	219
10,645	.....	15 00	12 00	.....	.....	1	1	3,820	10	....	10	.....	220
240,023	.....	18 30	10 80	.....	.....	8	....	9,300	no	no	.....	.....	221
11,906	.....	11 76	8 40	.....	.....	2	....	2,013	no	no	.....	.....	222
1,800	.....	12 00	9 00	.....	.....	1	....	800	no	no	.....	.....	223
41,264	.....	16 50	.....	.....	.....	8	3	4,883	35	....	.....	.....	224
25,000	.....	15 00	.....	.....	.....	2	1	7,000	.....	....	.....	.....	225
20,000	both	5 00	average	for	all	3	2	6,310	no	no	.....	.....	226
3,500	.....	12 00	7 50	.....	.....	....	....	.....	10	....	10	.....	227
2,500	.....	15 00	9 00	.....	.....	....	....	.....	.....	....	.....	.....	228
4,300	2,600	15 00	7 50	7 00	4 00	3	1	3,200	yes	....	yes	.....	229
13,500	4,500	16 50	9 00	7 50	4 50	2	3	6,800	no	no	.....	.....	230
2,080	350	21 00	.....	10 50	.....	....	....	.....	.....	....	.....	.....	231
6,147	.....	18 00	12 10	.....	.....	16	11	20,620	13	....	13	13	232
42,939	360	18 00	9 75	7 20	.....	5	1	5,860	17½	....	17½	.....	233
4,175	.....	12 00	8 10	.....	.....	2	1	2,500	.....	....	.....	.....	234
FACTORIES.—TABLE NO. 7.													
23,960	.....	16 50	6 60	.....	.....	2	....	2,600	5	....	5	.....	235
55,339	656	10 08	average	6 36	.....	3	....	5,600	4	....	4	.....	236
17,000	.....	18 00	9 00	.....	.....	5	1	3,500	.....	....	.....	.....	237
835	.....	10 00	9 00	.....	.....	....	....	.....	.....	....	.....	.....	238
14,452	.....	11 56	average	.....	.....	2	1	3,299	.....	....	.....	.....	239
FACTORIES.—TABLE NO. 8.													
75,467	both	8 57	average	for	all	9	1	818,343	no	no	.....	.....	240
2,200	4,500	10 50	5 00	7 00	4 00	3	1	2,500	10	....	10	10	241
13,444	both	12 50	.....	9 00	4 75	1	1	4,000	yes	....	.....	.....	242
3,283	.....	21 00	15 00	.....	.....	3	....	2,070	no	no	.....	.....	243
13,184	.....	11 10	9 60	.....	.....	5	1	6,628	5	....	5	5	244
2,000	5,000	15 00	9 00	9 00	4 80	....	1	325	10	....	10	10	245
18,000	both	12 00	4 00	8 50	4 00	2	....	750	.....	yes	.....	.....	246
2,944	5,200	17 25	6 00	8 40	4 50	1	....	1,000	no	no	.....	.....	247
15,000	both	12 00	average	7 50	av.	2	1	3,000	20	....	.....	.....	248
16,400	24,300	12 00	8 00	10 00	6 00	4	2	5,400	no	no	.....	.....	249
1,200	1,200	15 00	6 00	6 00	2 40	....	....	.....	yes	....	.....	.....	250
4,000	1,000	18 00	15 00	8 40	8 40	2	2	3,500	10	....	10	10	251
4,875	540	12 00	5 25	7 00	3 50	1	2	.....	no	no	.....	.....	252
23,500	1,464	13 50	9 00	10 50	.....	3	....	4,300	no	no	.....	.....	253
2,600	4,800	12 75	average	5 23	av.	....	....	.....	.....	....	.....	.....	254
18,000	both	10 08	average	for	all	5	4	7,000	10	....	.....	.....	255
6,500	1,100	18 50	15 50	7 33	.....	....	2	900	10	....	10	10	256
4,000	10,000	15 00	8 00	9 00	3 00	5	2	4,000	10	....	10	10	257

RETURNS IN DETAIL

Foundries and Rolling Mills, Bridge and Structural

Office No.	Capital employed, including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
258	264,000	365	394,688	18	.....	206	698	15,522	.....	114	.....
259	48,000	291	59,500	.....	1¾	425	425	1,500	21,650	45	.....
260	65,000	300	40,000	no	no	127	371	.....	.....	26	.....
261	108,291	285	486,577	15	.....	702	1,249	.....	.....	135	.....
262	189,541	298	438,574	28	.....	552	1,272	.....	.....	176	.....
263	642,409	303	822,202	53	.....	498	3,410	.....	.....	317	.....
264	24,000	305	10,000	2	.....	65	90	200	500	8	.....
265	180,615	280	200,000	35	.....	488	1,870	5,712	26,434	145	.....
266	.....	305	.....	.....	.....	.....	.....	.....	.....	100	.....
267	10,000	250	.....	no	no	150	60	.....	.....	4	.....
268	1,000,000	275	1,400,000	10	.....	5,750	5,050	40,000	150,000	800	.....
269	174,000	276	123,000	14	.....	490	1,345	.....	.....	63	.....
270	113,700	300	137,213	28	.....	45	542	2,460	.....	24	.....
271	99,862	300	167,630	.....	1¼	332	521	.....	.....	110	.....
272	38,000	300	70,000	.....	yes	74	133	.....	.....	38	.....
273	10,000	262	60,310	5	.....	95	183	.....	.....	45	.....
274	30,000	300	11,000	25	.....	50	73	3,000	.....	11	.....
275	6,000	275	10,000	yes	.....	100	50	.....	.....	7	.....
276	225,000	300	213,000	10	.....	910	95	10,397	5,000	130	.....
277	10,000	305	17,000	.....	.....	80	100	.....	.....	7	.....
278	60,000	300	60,000	10	.....	130	95	200	.....	40	.....
279	75,000	305	100,000	15	.....	468	556	8,000	.....	50	.....
280	25,000	300	50,000	10	.....	200	198	1,000	2,000	30	.....
281	56,629	300	80,000	44	.....	159	18	3,543	.....	27	.....
282	200,000	300	150,000	25	.....	300	.....	10,000	9,000	50	.....
283	65,000	280	49,600	10	.....	161	34	600	23,000	18	.....
284	120,000	280	90,000	20	.....	112	585	4,100	3,000	61	.....
285	5,000	300	6,000	20	.....	58	25	.....	.....	4	.....
286	10,000	300	8,000	no	no	85	.....	.....	.....	7	.....
287	1,260,000	225	296,500	50	.....	700	1,473	.....	.....	150	.....
288	29,000	300	25,000	10	.....	135	450	500	100	25	.....

Stove Manufacturers, Hot Air Furnaces

289	200,000	313	185,000	25	.....	420	1,479	2,179	17,210	80	.....
290	65,000	300	38,522	.....	7½	177	326	.....	.....	22	.....
291	24,000	330	8,000	30	.....	12	.....	.....	2,000	6	.....
292	100,000	290	162,000	13	.....	1,593	1,943	.....	4,400	120	.....
293	90,000	300	50,000	10	.....	328	909	.....	.....	43	.....
294	400,000	290	275,000	25	.....	2,000	3,300	.....	5,000	175	.....
295	290,000	265	500,000	20	.....	800	2,470	9,000	10,200	310	.....
296	48,000	280	52,000	20	.....	212	213	5,300	640	27	.....
297	15,000	315	11,600	20	.....	20	30	200	422	4	.....
298	24,000	300	8,000	yes	.....	120	166	.....	.....	15	.....
299	65,000	305	140,000	7	.....	82	1,063	1,112	64,519	110	.....
300	50,000	305	85,000	no	no	164	1,240	.....	.....	33	.....
301	7,000	305	13,500	10	.....	.....	25	600	.....	7	.....
302	300,000	300	200,000	10	.....	600	1,000	.....	.....	150	.....
303	13,000	300	10,000	no	no	226	123	.....	3,000	8	.....
304	30,000	300	25,000	50	.....	140	152	2,000	.....	15	.....
305	200,000	297	133,567	24	.....	1,067	1,600	2,482	1,148	85	.....
306	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....

FROM MANUFACTURERS.

Iron Works.—Table No. 9.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
71,849	.....	18 00	10 80	.....	.....	9	1	14,212	no	no	.....	.....	258
25,500	.....	22 88	11 25	.....	.....	4	1	.....	no	no	.....	.....	259
14,316	.....	18 00	11 25	.....	.....	2	....	3,250	4	....	4	.....	260
89,080	.....	14 05	average	.....	.....	5	....	6,296	.....	....	.....	.....	261
94,871	.....	10 80	average	.....	.....	6	....	4,500	.....	....	.....	.....	262
193,240	.....	12 20	average	.....	.....	6	1	6,360	.....	....	.....	.....	263
4,000	.....	9 00	5 40	.....	.....	.....	.....	.....	no	no	.....	.....	264
85,787	.....	16 08	9 06	.....	.....	9	1	11,760	6	....	4¼	7¼	265
.....	.....	.....	.....	.....	.....	3	1	.....	.....	....	.....	.....	266
2,000	.....	13 50	11 25	.....	.....	1	....	600	no	no	.....	.....	267
500,000	.....	13 60	average	.....	.....	40	....	60,000	10	....	.....	.....	268
35,012	.....	12 07	average	.....	.....	9	1	10,760	15	....	15	.....	269
12,357	.....	13 80	10 80	.....	.....	3	3	6,580	10	....	10	10	270
69,676	.....	18 00	.....	.....	.....	.....	.....	.....	8	....	8	.....	271
13,689	.....	15 00	10 50	.....	.....	6	1	6,500	no	no	.....	.....	272
27,963	.....	19 50	12 15	.....	.....	.....	.....	.....	5	....	.....	.....	273
6,552	.....	18 38	12 00	.....	.....	1	....	300	10	....	10	.....	274
3,000	.....	12 00	8 75	.....	.....	1	....	.....	no	no	.....	.....	275
71,737	.....	17 25	10 95	.....	.....	9	3	9,448	5	....	5	.....	276
3,500	.....	10 20	average	.....	.....	.....	.....	.....	no	no	.....	.....	277
15,000	.....	7 50	average	.....	.....	2	1	2,650	5	....	.....	.....	278
38,714	.....	18 00	12 00	.....	.....	1	....	1,200	10	....	10	.....	279
24,000	.....	18 60	12 00	.....	.....	3	....	3,000	6½	....	6½	.....	280
12,199	.....	16 74	11 25	.....	.....	3	1	4,618	15	....	15	15	281
35,000	.....	28 50	10 50	.....	.....	5	1	8,000	no	no	.....	.....	282
13,500	.....	19 05	13 80	.....	.....	3	....	6,000	9	....	9	.....	283
26,400	.....	15 75	9 75	.....	.....	6	....	4,600	15	....	15	.....	284
2,200	.....	13 50	9 00	.....	.....	.....	.....	.....	no	no	.....	.....	285
4,000	.....	15 00	10 50	.....	.....	.....	.....	.....	.....	....	.....	.....	286
82,700	.....	14 51	average	.....	.....	3	1	11,000	no	no	.....	.....	287
12,000	.....	15 00	9 75	.....	.....	1	1	.....	5	....	.....	.....	288

and Heating Apparatus.—Table No. 10.

63,729	.....	18 00	10 50	.....	.....	3	2	2,713	20	....	20	.....	289
14,316	.....	17 25	11 25	.....	.....	2	....	2,733	5	....	5	.....	290
2,808	.....	12 00	6 00	.....	.....	2	....	2,000	yes	....	yes	.....	291
66,700	.....	11 60	average	.....	.....	8	....	7,000	no	no	.....	.....	292
19,000	.....	8 84	average	.....	.....	4	1	5,400	yes	....	.....	.....	293
107,000	.....	16 50	10 50	.....	.....	.....	.....	23,400	7	....	5	.....	294
170,000	.....	20 00	10 50	.....	.....	12	3	14,200	10	....	.....	.....	295
18,426	.....	15 00	9 90	.....	.....	1	1	1,512	3	....	3	.....	296
1,638	.....	19 23	12 50	.....	.....	2	1	1,920	10	....	10	10	297
4,200	.....	5 60	average	.....	.....	2	....	.....	yes	....	yes	.....	298
56,684	.....	18 00	10 50	.....	.....	4	1	7,462	yes	....	.....	.....	299
22,360	.....	13 25	average	.....	.....	7	1	8,000	no	no	.....	.....	300
2,845	.....	15 00	9 00	.....	.....	2	....	1,500	5	....	5	.....	301
65,000	.....	18 00	10 50	.....	.....	12	2	.....	5	....	5	5	302
4,065	.....	12 00	10 80	.....	.....	.....	.....	.....	no	no	.....	.....	303
7,000	.....	18 10	9 75	.....	.....	....	1	1,500	10	....	10	10	304
47,023	.....	15 60	10 50	.....	.....	8	1	6,700	3	....	3	.....	305
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	.....	.....	306

RETURNS IN DETAIL

ENGINES, BOILERS AND MACHINERY FACTORIES; ENGINEERS

Office No.	Capital employed including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
307	131,000	300	40,000	.....	50	900	800	.....	.....	30	.....
308	51,000	300	96,265	13¼	.....	348	270	2,716	.....	96	.....
309	40,000	300	120,000	25	.....	157	1,161	1,000	.....	60	.....
310	25,000	300	53,000	19	.....	175	580	.....	500	45	.....
311	35,000	304	20,000	no	no	350	215	.....	.....	12	.....
312	25,000	305	58,000	yes	.....	60	290	1,500	10,500	13	.....
313	16,000	305	21,000	16	.....	18	6,000	.....	.....	14	.....
314	35,700	300	19,000	.....	8	125	284	.....	1,200	10	.....
315	13,500	300	10,000	no	no	228	125	.....	1,200	9	.....
316	550,000	306	350,000	30	.....	600	2,000	10,000	210,000	75	18
317	15,000	300	.....	no	no	224	.....	.....	.....	.....	.....
318	60,000	300	65,000	6	.....	252	36,446	.....	.....	48	.....
319	40,000	300	65,000	10	.....	100	700	2,000	200	10	.....
320	35,000	300	30,000	no	no	130	35	600	.....	8	.....
321	1,500	300	7,695	.....	25	80	25	.....	.....	2	.....
322	52,000	305	44,434	no	no	85	346	300	.....	20	.....
323	412,500	300	600,000	20	.....	3,600	4,000	8,000	.....	236	.....
324	.....	300	25,850	.....	.....	162	.....	.....	4,194	16	.....
325	45,000	308	40,008	23	.....	212	429	1,500	.....	38	.....
326	8,000	300	10,000	10	.....	.....	.....	3,000	.....	10	.....
327	105,226	305	63,048	2½	.....	24	195	161	34,486	15	.....
328	10,000	300	.....	.....	.....	12	32	.....	.....	10	.....
329	.....	300	320,000	.....	.....	1,260	1,050	.....	.....	150	.....
330	4,000	300	.....	no	no	51	.....	.....	.....	3	.....
331	30,000	305	50,000	25	.....	100	75	2,000	.....	6	.....
332	35,000	300	19,000	.....	8	125	284	.....	1,200	10	.....
333	6,000	305	.....	.....	.....	.....	1,500	.....	.....	6	.....
334	400,000	300	190,000	no	no	.....	.....	.....	.....	95	.....
335	45,000	300	72,000	10	.....	270	710	1,000	15,000	40	.....
336	.....	300	160,000	.....	15	790	1,350	.....	.....	125	.....
337	24,000	305	19,644	yes	.....	85	105	.....	.....	18	.....
338	1,000	200	.....	no	no	25	.....	.....	.....	.....	.....
339	70,000	300	60,000	.....	15	275	1,000	2,500	.....	30	.....
340	4,000	306	1,825	no	no	.....	25	250	.....	1	.....
341	600,000	305	275,000	.....	.....	.....	.....	.....	.....	128	.....
342	30,000	303	20,287	60	.....	37	336	500	200	15	.....
343	1,000	....	.....	no	no	24	.....	.....	.....	.....	.....
344	65,400	354	63,240	10	.....	312	240	2,140	.....	26	.....
345	.....	300	60,000	yes	.....	55	20	700	.....	14	.....
346	25,000	300	25,600	no	no	248	258	.....	.....	17	.....
347	70,724	308	42,258	10	.....	444	375	.....	2,993	38	.....
348	60,000	300	59,000	25	.....	310	390	2,000	4,800	20	.....
349	200,000	300	93,000	20	.....	286	400	3,000	.....	35	.....
350	23,200	305	58,192	.....	.....	63	387	.....	.....	17	.....
351	10,000	275	15,000	10	.....	200	2,000	3,000	.....	15	.....
352	50,000	300	20,000	no	no	125	250	.....	.....	7	.....
353	32,000	345	86,000	50	.....	187	744	4,000	9,000	55	.....
354	20,000	300	12,000	5	.....	150	225	3,000	.....	9	.....
355	728,000	280	650,000	10	.....	3,500	500	95,000	85,200	372	.....
356	60,000	300	45,375	20	.....	188	540	.....	.....	25	.....
357	584,000	305	135,000	.....	.....	2,000	1,600	7,000	.....	135	.....
358	2,500	305	10,000	no	no	81	.....	.....	2,600	3	.....
359	75,000	305	40,000	30	.....	69	257	.....	.....	6	.....
360	16,000	313	16,388	33⅓	.....	179	53	792	1,039	5	.....
361	100,000	305	75,000	25	.....	100	700	15,000	.....	35	.....

FROM MANUFACTURERS.

AND MACHINE SHOPS.—TABLE No. 11.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
13,000	.....	13 20	9 00	.....	.....	4	1	7.500	5	....	5	5	307
41,161	.....	8 58	average	.....	.....	6	2	.....	5	....	5	5	308
35,000	.....	17 25	10 50	.....	.....	3	1	3,240	5	....	.....	.....	309
20,000	.....	19 50	12 75	.....	.....	....	1	416	20	....	20	.....	310
13,425	.....	21 80	average	.....	.....	1	....	600	no	no	.....	.....	311
5,800	.....	18 60	13 20	.....	.....	3	1	5.600	10	....	.....	.....	312
9,000	.....	19 20	12 00	.....	.....	1	1	.....	7	....	7	.....	313
4,000	.....	9 20	average	.....	.....	1	1	1,540	6	....	.....	.....	314
4,200	.....	12 00	4 50	.....	.....	.....	.....	.....	no	no	.....	.....	315
42,000	8,000	21 00	12 00	12 00	7 50	12	4	16,000	8	....	8	8	316
4,618	.....	16 50	.....	.....	.....	1	....	.....	7½	....	7½	.....	317
25,907	.....	21 00	10 20	.....	.....	2	1	3,900	.....	.....	.....	.....	318
7,000	.....	19 50	12 00	.....	.....	1	1	3,000	10	....	10	10	319
6,000	.....	12 00	7 20	.....	.....	1	1	1,000	10	....	10	10	320
2,288	.....	21 00	.....	.....	.....	2	....	1,350	no	no	.....	.....	321
10,000	.....	13 50	10 50	.....	.....	3	....	4,000	.....	.....	.....	.....	322
139,950	.....	12 66	average	.....	.....	11	5	30,000	22½	....	22½	22½	223
7,980	.....	15 00	10 50	.....	.....	3	....	2,100	yes	....	.....	.....	324
18,445	.....	15 75	9 60	.....	.....	.....	.....	.....	5	....	5	.....	325
3,500	.....	18 00	6 00	.....	.....	2	....	1.500	.....	.....	.....	.....	326
9,119	.....	12 48	average	.....	.....	1	1	2.112	5	....	5	5	327
4,752	.....	15 00	8 25	.....	.....	1	....	936	.....	.....	.....	.....	328
80,000	.....	14 40	10 50	.....	.....	.....	.....	.....	no	no	.....	.....	329
.....	.....	15 00	.....	.....	.....	.....	.....	.....	no	no	.....	.....	330
6,000	.....	22 50	15 00	.....	.....	2	....	1,500	no	no	.....	.....	331
4.600	.....	9 20	average	.....	.....	1	1	1,540	6	....	.....	.....	332
.....	.....	12 12	9 66	.....	.....	.....	.....	.....	6	....	.....	.....	333
65,000	.....	13 70	average	.....	.....	.....	3	.....	7½	....	7½	7½	334
16,300	.....	15 00	9 50	.....	.....	1	1	750	3	....	3	3	335
62,290	.....	21 75	12 75	.....	.....	2	1	2.720	20	....	20	.....	336
8,660	.....	19 50	13 50	.....	.....	....	1	525	8	....	8	.....	337
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	338
20,000	.....	21 00	10 50	.....	.....	4	2	7.500	.....	10	.....	.....	339
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	340
80,000	.....	12 25	average	.....	.....	8	....	16,000	.....	.....	.....	.....	341
6,163	.....	8 20	average	.....	.....	....	1	312	.....	.....	.....	.....	342
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	343
25,600	.....	15 00	10 50	.....	.....	3	....	3.200	10	....	10	.....	344
5.000	.....	16 50	10 50	.....	.....	2	....	1.350	yes	....	.....	.....	345
9,457	.....	19 20	12 00	.....	.....	.....	.....	.....	no	no	.....	.....	346
20,069	.....	14 40	10 20	.....	.....	1	.....	.....	5	....	5	5	347
13,000	.....	18 00	10 50	.....	.....	3	....	2,400	no	no	.....	.....	348
11,500	.....	13 50	10 50	.....	.....	2	1	2,700	3	....	3	.....	349
7,187	.....	21 60	9 00	.....	.....	3	1	4.940	no	no	.....	.....	350
5,000	.....	14 00	6 50	.....	.....	.....	.....	.....	5	....	.....	.....	351
5,250	.....	19 50	12 00	.....	.....	2	1	2,400	no	no	.....	.....	352
29,800	.....	19 50	12 60	.....	.....	....	2	1,400	no	no	.....	.....	353
6,500	.....	24 60	.....	.....	.....	2	....	1,800	no	no	.....	.....	354
197,765	.....	18 00	11 10	.....	.....	43	12	49,500	5	....	5	5	355
9,122	.....	15 00	10 50	.....	.....	2	....	4,000	.....	.....	.....	.....	356
80,000	.....	16 50	10 50	.....	.....	9	....	12,000	no	no	.....	.....	357
2,600	.....	17 00	average	.....	.....	3	....	3,000	yes	....	yes	.....	358
2,413	.....	18 00	12 00	.....	.....	2	1	3,380	.....	.....	.....	.....	359
2,986	.....	18 17	11 25	.....	.....	1	1	1,812	10	....	10	.....	360
18,000	.....	18 00	12 00	.....	.....	3	4	10,000	15	....	15	.....	361

RETURNS IN DETAIL

Engines, Boilers and Machinery Factories; Engineers

Office No.	Capital employed, including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year. Increased.	Production during year. Decreased.	Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only. Male.	Female.
	$		$	%	%	$	$	$	$		
362	9,155	300	12,839	no	no	6	94	.....	8,211	3	.....
363	800,000	305	600,000	20	.....	2,000	6,000	.....	.....	350	.....
364	61,225	308	48,417	¼	.....	798	282	904	.....	28	.....
365	15,000	305	30,000	7	.....	.....	250	.....	.....	10	.....
366	6,000	312	5,500	no	no	25	86	.....	.....	.....	.....
367	35,000	286	25,000	no	no	110	125	1,200	.....	22	.....
368	5,000	300	10,000	25	.....	26	30	.....	.....	4	.....
369	20,000	310	15,000	no	no	260	211	.....	.....	15	.....
370	.....	300	125,000	yes	.....	180	450	.....	.....	68	.....
371	303,714	300	157,400	43	.....	.....	368	75,738	12,957	81	6
372	77,006	305	36,500	20	.....	204	420	.....	1,031	20	.....
373	60,000	300	25,000	20	.....	100	130	30,000	.....	23	.....
374	250,000	300	297,500	12	.....	242	393	8,000	146,254	175	.....

Metallic Roofing, Bolts, Nuts and

375	14,801	313	18,629	15	.....	179	53	325	1,202	5	.....
376	26,629	310	28,347	14	.....	48	39	.....	.....	8	.....
377	.....	300	130,000	yes	.....	.....	.....	.....	.....	70	.....
378	.....	300	125,000	50	.....	70	1,800	25,000	.....	45	.....
379	.....	300	350,000	10	.....	500	6,000	150,000	.....	175	.....
380	12,000	305	15,000	20	.....	.....	.....	.....	.....	.....	.....
381	.....	300	36,000	10	.....	119	215	.....	3,000	20	.....
382	130,000	304	60,000	.....	.....	103	89	5,755	.....	22	.....
383	1,222,723	304	450,000	.....	.....	1,881	656	9,002	.....	262	.....
384	35,000	305	35,000	20	.....	50	100	4,000	.....	13	7
385	26,643	309	28,462	12	.....	93	25	.....	7,978	12	.....
386	560,000	300	325,000	25	.....	550	1,650	10,000	210,000	95	15
387	330,000	300	640,700	6½	.....	2,850	1,450	11,000	.....	300	.....
388	137,413	302	88,684	11½	.....	.....	995	500	.....	65	.....
389	.....	305	65,000	20	.....	.....	500	.....	.....	35	.....
390	5,000	300	15,000	yes	.....	40	25	.....	.....	7	.....
391	100,000	305	100,000	15	.....	.....	.....	.....	.....	22	.....
392	20,000	305	28,000	20	.....	60	5,000	900	.....	10	.....
393	45,000	300	87,162	20	.....	240	230	.....	400	75	.....
394	15,000	185	7,897	.....	.....	59	105	.....	.....	9	.....
395	75,000	300	40,000	100	.....	500	450	1,000	2,000	35	.....
396	70,000	300	50,000	no	no	350	50	731	3,753	25	.....
397	60,000	300	120,000	22	.....	174	1,086	7,000	13,849	45	5
398	4,500	300	5,200	no	no	40	15	500	.....	5	.....
399	150,000	300	125,000	no	no	520	1,385	6,000	.....	130	20
400	80,000	305	50,000	10	.....	280	90	35,000	20,000	45	4
401	112,631	300	92,156	.....	29	743	1,290	599	71,760	32	3
402	462,115	304	833,676	8⅓	.....	2,314	345	43,398	26,659	550	5

Wire Fence, Wire Rope and

403	50,000	300	171,346	.....	.....	16	908	1,222	1,500	18	.....
404	.....	300	23,000	no	no	200	370	.....	.....	8	.....
405	150,000	200	250,000	no	no	300	350	2,000	10,000	30	.....
406	4,500	350	7,000	no	no	185	.....	.....	.....	10	.....
407	40,000	310	50,000	25	.....	30	116	18,000	2,500	40	.....
408	75,000	300	75,000	.....	10¾	127	300	.....	.....	10	.....
409	250,000	290	450,000	yes	.....	75	625	.....	.....	120	7
410	54,250	200	30,168	.....	yes	166	312	449	5,173	7	.....

FROM MANUFACTURERS.

AND MACHINE SHOPS.—TABLE No. 11.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
1,209	.....	.....	8 00	.....	.....	1	....	599	no	no	.....	.....	362
220,000	.....	12 33	average	.....	.....	30	....	42,000	.....	....	.....	.....	363
13,168	.....	17 25	8 55	.....	.....	3	....	780	10	....	10	.....	364
5,000	.....	18 00	.....	.....	.....	....	1	520	5	....	5	.....	365
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	366
11,000	.....	10 40	average	.....	.....	1	1	1,800	.....	....	.....	.....	367
1,800	.....	9 00	average	.....	.....	....	....	.....	no	no	.....	.....	368
7,500	.....	14 25	9 60	.....	.....	1	....	1,000	.....	....	.....	.....	369
30,000	.....	15 00	10 50	.....	.....	8	....	10,000	yes	....	.....	.....	370
47,425	1,560	14 29	10 20	.....	5 00	2	2	1,924	5	....	5	5	371
9,743	.....	13 50	12 00	.....	.....	2	1	2,696	.....	....	.....	.....	372
8,000	.....	12 75	6 75	.....	.....	1	....	1,500	20	....	20	.....	373
114,900	.....	18 00	10 50	.....	.....	9	2	10,850	5	....	5	.....	374

LIGHT IRONWARE.—TABLE No. 12.

3,376	.....	18 48	12 00	.....	.....	1	1	1,818	5	....	5	.....	375
3,403	.....	18 00	12 00	.....	.....	2	....	2,600	20	....	20	.....	376
30,000	.....	8 57	average	.....	.....	....	....	.....	.....	....	.....	.....	377
30,000	.....	13 33	average	.....	.....	3	....	3,300	yes	....	.....	.....	378
75,000	.....	8 57	average	.....	.....	12	4	20,000	yes	....	.....	.....	379
.....	.....	.....	.....	.....	.....	1	....	1,200	.....	....	.....	.....	380
9,000	.....	9 00	average	.....	.....	3	....	2,700	10	....	10	.....	381
11,524	.....	15 00	10 80	.....	.....	2	2	3,112	.....	....	.....	.....	382
151,807	.....	15 75	9 90	.....	.....	13	11	26,649	no	no	.....	.....	383
.....	.....	15 00	9 00	7 50	5 70	....	....	.....	10	....	10	.....	384
9,402	.....	15 75	9 60	.....	.....	3	1	2,500	10	....	.....	.....	385
43,250	6,750	19 50	11 25	10 50	7 50	11	4	16,800	5	....	5	5	386
166,325	.....	21 00	10 50	.....	.....	11	4	25,218	9½	....	.....	.....	387
18,902	.....	5 82	average	.....	.....	7	1	11,000	1	....	1	.....	388
22,000	.....	23 11	11 70	.....	.....	4	....	2,760	no	no	.....	.....	389
3,000	.....	18 00	10 50	.....	.....	....	1	300	yes	....	.....	.....	390
9,976	.....	9 20	average	.....	.....	11	4	8,356	10	....	10	10	391
4,000	.....	13 80	average	.....	.....	....	1	300	10	....	.....	.....	392
32,378	.....	21 00	14 10	.....	.....	3	....	3,500	7½	....	7½	7½	393
3,914	.....	10 50	average	.....	.....	.....	.....	.....	no	no	.....	.....	394
16,000	.....	15 00	10 50	.....	.....	3	1	1,475	5	....	5	.....	395
15,249	.....	16 00	10 20	.....	.....	1	1	1,816	.....	....	.....	.....	396
22,950	1,000	18 0	10 00	8 00	4 00	4	3	9,609	yes	....	.....	.....	397
2,500	.....	14 25	average	.....	.....	.....	.....	.....	.....	....	.....	.....	398
45,000	6,000	19 50	9 75	9 00	6 00	2	2	3,500	5	....	.....	.....	399
20,000	1,200	15 00	9 00	6 00	4 80	1	2	800	5	....	5	.....	400
20,000	1,200	20 50	11 25	6 60	.....	2	1	4,225	5	....	5	10	401
290,576	15,525	13 60	average	6 09	av.	13	11	15,679	10	....	10	10	402

WIRE CLOTH FACTORIES.—TABLE No. 13.

6,245	.....	6 94	average	.....	.....	2	2	4,400	no	no	.....	.....	403
3,000	.....	7 50	average	.....	.....	1	1	2,000	.....	....	.....	.....	404
14,000	.....	16 50	10 50	.....	.....	5	3	10,000	no	no	.....	.....	405
4,000	.....	7 00	average	.....	.....	2	....	850	no	no	.....	.....	406
12,000	.....	18 00	9 00	.....	.....	1	....	600	no	no	.....	.....	407
3,300	.....	15 00	10 50	.....	.....	3	2	2,800	no	no	.....	.....	408
95,000	4,000	16 50	average	11 90	av'ge	10	7	18,000	10	....	10	10	409
2,717	.....	15 00	10 50	.....	.....	2	1	2,130	no	no	.....	.....	410

RETURNS IN DETAIL

WIRE FENCE, WIRE ROPE AND

Office No.	Capital employed including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
411	14,000	300	12,000	25	.....	58	130	.....	.....	10	3
412	120,000	250	80,000	no	no	19	324	.....	.....	12	.....
413	74,700	300	150,000	5	.....	339	800	3,000	22,000	70	.....
414	7,000	300	10,000	10	.....	44	205	.....	.....	6	.....
415	837,800	276	677,369	12½	.....	4,173	3,243	25,963	86,821	250	.....

BRASS AND COPPERWARE FACTORIES AND

416	70,000	304	93,005	2⅔	.....	87	93	.....	4,732	5	.....
417	475,000	225	300,000	.....	.....	1,325	2,270	48,000	.....	175	.....
418	31,085	305	35,390	yes	.....	129	421	500	.....	24	3
419	60,000	300	65,000	no	no	682	2,695	.....	.....	25	5
420	75,148	305	40,160	yes	.....	150	327	.....	.....	25	.....
421	5,000	270	12,000	1½	.....	7	13	100	1,500	6	.....
422	450,000	300	242,725	7	.....	1,352	3,120	.....	.....	160	.....
423	10,000	....	.....	.....	.....	.....	150	.....	.....	4	.....
424	52,000	250	103,600	9	.....	172	416	.....	2,460	32	.....
425	50,000	300	35,000	50	.....	198	360	3,000	.....	32	.....
426	91,300	300	114,917	7	.....	.....	.....	.....	.....	54	5
427	250,000	300	400,000	yes	.....	1,500	1,900	.....	.....	180	.....
428	27,000	305	75,000	yes	.....	.....	400	.....	.....	15	.....
429	30,000	305	50,000	no	no	340	300	.....	.....	38	.....
430	50,000	300	90,000	11	.....	219	506	4,000	.....	53	12
431	75,000	300	250,000	20	.....	496	357	15,000	.....	65	2

SILVER AND PLATEDWARE FACTORIES

432	500,000	274	386,935	1½	.....	814	1,432	12,665	23,564	102	30
433	12,000	304	25,000	20	.....	25	190	300	250	13	.....
434	283,457	300	193,200	11½	.....	848	1,521	7,321	9,296	100	6
435	2,300	200	4,500	.....	30	112	30	.....	.....	3	1
436	25,000	300	47,500	5	.....	150	150	500	500	25	2
437	3,079	304	9,575	.....	.....	17	31	.....	1,323	11	1
438	300,000	295	259,800	14	.....	459	1,720	3,386	2,622	90	15

WOOLLENS, COTTONS, LINENS AND

439	800,000	288	620,000	no	no	3,733	469	75,000	.....	112	194
440	2,000,000	298	1,790,000	no	no	8,500	2,200	20,000	.....	605	412
441	75,000	300	80,000	15	.....	375	350	3,000	.....	20	25
442	.....	278	357,199	2	.....	574	482	.....	.....	85	170
443	10,000	200	8,000	.....	yes	125	75	.....	.....	.....	50
444	3,000	200	1,500	no	no	25	.....	.....	125	2	.....
445	25,000	200	10,000	no	no	125	220	1,000	.....	25	18
446	10,000	305	23,000	3½	.....	109	140	.....	.....	6	3
447	25,000	240	10,700	.....	33	220	140	.....	300	40	15
448	15,000	300	10,000	10	.....	60	900	100	200	5	.....
449	140,000	305	85,000	3	.....	490	1,194	.....	14,000	57	33
450	9,500	250	8,300	.....	yes	61	57	275	35	55	25

FROM MANUFACTURERS.

WIRE CLOTH FACTORIES.—TABLE NO. 13.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
4,400	600	8 80	average	4 00	av'ge	1	1	1,800	5	....	5	.....	411
4,996	.....	15 00	10 50	.....	.....	1	1	3,920	15	....	15	.....	412
41,000	.....	15 00	9 75	.....	.....	4	3	6,000	no	no	.....	.....	413
3,700	.....	17 25	11 25	.....	.....	....	1	600	10	....	10	.....	414
115,322	.....	18 00	10 50	.....	.....	15	7	27,517	yes	....	.....	.....	415

PLUMBERS' SUPPLIES.—TABLE NO. 14.

4,255	.....	17 37	10 20	.....	.....	3	1	6,660	no	no	.....	.....	416
68,751	.....	18 00	11 25	.....	.....	8	4	15,331	6½	....	6½	.....	417
12,829	832	10 48	average	5 38	av'ge	3	....	3,656	yes	....	.....	.....	418
13,800	1,700	15 00	7 50	12 00	6 00	5	2	8,000	.....	....	.....	.....	419
16,075	.....	18 00	11 25	.....	.....	4	2	6,000	yes	....	.....	.....	420
5,600	.....	18 00	10 00	.....	.....	....	....	.....	2½	....	2½	.....	421
72,229	.....	15 00	10 50	.....	.....	....	6	26,295	2½	....	2½	.....	422
650	.....	8 00	5 00	.....	.....	....	....	.....	.....	....	.....	.....	423
16,404	.....	16 50	8 25	.....	.....	1	....	1,200	no	no	.....	.....	424
13,500	.....	15 60	9 00	.....	.....	2	1	2,550	yes	....	.....	.....	425
30,892	both	18 00	10 50	4 81	.....	6	4	.....	15	....	15	.....	426
70,000	.....	18 00	11 25	.....	.....	7	5	15,000	yes	....	.....	.....	427
6,718	.....	19 50	15 00	.....	.....	2	....	4,000	5	....	5	5	428
15,500	.....	16 50	11 25	.....	.....	2	....	2,000	10	....	10	10	429
23,500	3,500	15 75	9 75	5 40	.....	2	2	5,000	10	....	.....	.....	430
30,000	both	16 50	12 00	.....	.....	5	1	5,500	12½	....	12½	12½	431

JEWELRY FACTORIES.—TABLE NO. 15.

81,955	9,376	15 75	9 50	8 00	6 00	3	2	16,090	3	....	3	3	432
6,158	.....	16 00	4 00	.....	.....	....	2	832	5	....	5	20	433
62,529	both	17 25	8 70	7 00	3 50	13	6	20,250	15½	....	.....	.....	434
1,800	both	13 00	.....	5 00	.....	....	....	.....	.....	....	.....	.....	435
9,500	500	18 00	5 00	5 00	.....	1	2	2,300	5	....	.....	.....	436
4,929	both	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	437
62,378	both	12 12	average	for	all	4	1	10,264	yes	....	.....	.....	438

YARNS.—TABLE NO. 16.

54,000	63,000	12 00	6 63	7 06	4 63	4	....	3,700	no	no	.....	.....	439
250,800	117500	8 00	average	5 50	aver.	12	1	12,700	no	no	.....	.....	440
13,000	both	15 65	7 50	6 60	4 50	3	1	2,500	10	....	10	10	441
26,000	34,000	10 05	7 50	8 25	4 20	2	1	3,712	no	no	.....	.....	442
.....	7,000	.....	.....	9 00	4 50	....	....	.....	25	....	.....	.....	443
752	.....	6 00	.....	.....	.....	....	....	.....	10	....	.....	.....	444
6,000	both	4 24	average	for	all	....	....	.....	25	....	.....	.....	445
3,840	877	16 00	10 00	6 50	5 50	....	....	.....	10	....	.....	.....	446
7,000	600	9 00	.....	7 50	.....	....	....	.....	no	no	.....	.....	447
2,000	.....	9 00	7 50	.....	.....	....	....	.....	.....	....	.....	.....	448
20,541	10,271	18 00	9 90	9 00	4 50	7	2	5,500	.....	....	.....	.....	449
6,000	both	10 50	7 05	.....	4 20	1	....	600	5	....	.....	.....	450

RETURNS IN DETAIL

WOOLLENS, COTTONS, LINENS AND

Office No.	Capital employed including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
451	10,000	300	20,000	no	no	.....	100	.....	.....	3	3
452	8,000	200	18,000	yes	.....	104	70	100	.....	2	.....
453	250,000	250	400,000	.....	.....	400	450	.....	.....	25	110
454	33,000	300	15,000	15	.....	309	368	500	.....	6	6
455	30,000	300	80,000	yes	.....	50	150	2,000	.....	18	2
456	20,000	224	18,000	.....	yes	140	.....	.....	.....	7	7
457	6,000	200	9,000	.....	yes	60	125	.....	.....	20	11
458	200,000	300	212,000	20	.....	990	1,000	3,500	800	75	39
459	100,000	300	75,000	5	.....	.....	675	3,000	.....	30	10
460	150,000	300	125,000	no	no	470	1,800	.....	11,000	75	25
461	12,000	234	10,158	12	.....	60	238	410	280	4	3
462	.....	150	3,000	yes	.....	10	30	300	.....	3	.....
463	1,000	100	300	.....	15	34	.....	.....	.....	.....	.....
464	.....	275	91,178	33½	.....	181	298	1,724	.....	2	13
465	3,000	200	1,500	no	no	25	8	.....	.....	4	.....
466	20,000	300	5,000	no	no	60	.....	.....	.....	4	.....
467	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....
468	25,000	300	60,000	10	.....	220	.....	1,200	.....	6	8
469	75,000	300	70,000	.....	.....	300	700	.....	.....	21	15
470	50,000	301	90,000	15	.....	58	450	900	45	8	.....
471	5,000	300	8,000	10	.....	60	30	500	.....	4	4
472	40,000	300	55,000	no	no	160	525	1,600	.....	24	11
473	125,000	300	150,000	no	no	446	600	3,000	75,000	70	50
474	20,000	300	15,000	15	.....	75	.....	400	300	5	14

KNITTED GOODS FACTORIES

475	200,000	280	260,000	15	.....	1,260	100	10,000	2,000	60	80
476	125,000	300	150,000	.....	.....	500	550	5,000	75,000	70	50
477	19,000	305	80,000	10	.....	360	449	3,000	1,700	7	15
478	70,000	245	151,000	34	.....	590	821	7,300	873	22	120
479	10,000	305	11,000	4½	.....	39	40	100	.....	.....	3
480	250,000	280	240,000	12	.....	1,200	125	4,500	.....	60	75
481	65,000	300	110,000	15	.....	190	875	4,500	4,650	20	35
482	316,500	300	47,000	no	no	26	425	.....	.....	8	15
483	3,225,600	308	3,527,122	7¼	.....	9,749	8,203	253,900	.....	2,267	both
484	.....	298	155,843	1¼	.....	336	2,942	.....	25,500	30	80
485	66,000	305	66,000	10	.....	375	800	1,200	50,064	12	42
486	48,000	303	72,000	yes	.....	150	700	2,400	.....	25	40
487	75,000	300	80,550	7½	.....	110	195	300	3,715	18	17
488	7,000	200	6,000	30	.....	27	63	.....	.....	2	3
489	455,200	305	589,142	12½	.....	1,104	4,080	54,500	33,880	100	180
490	100,000	280	260,000	10	.....	308	780	8,000	.....	22	79
491	70,000	300	75,000	25	.....	130	385	12,000	1,100	20	30
492	35,000	300	30,000	10	.....	169	290	2,000	.....	3	30
493	210,000	278	176,500	.....	16	496	493	4,050	11,300	14	40
494	50,826	300	66,000	.....	6	251	235	300	.....	7	35
495	.....	300	.....	yes	.....	100	.....	.....	.....	15	110

FROM MANUFACTURERS.

YARNS.—TABLE NO. 16—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c			$	%	%	%	%	
1,500	900	10 00	.....	6 00	.....	1	1	300	no	no	.....	.....	451
15,500	.....	20 00	10 00	.....	.....	.....	.....	.....	5	....	.....	.....	452
32,000	both	5 64	average	for	all	1	1	.....	.....	.....	.....	.....	453
2,400	1,200	8 00	average	4 00	aver.	1	....	1,000	15	....	15	15	454
8,000	both	8 00	average	for	all	.....	.....	.....	10	....	.....	.....	455
2,025	1,565	9 60	6 60	6 00	4 80	.....	.....	.....	no	no	.....	.....	456
6,760	both	10 50	9 00	7 50	.....	.....	.....	.....	no	no	.....	.....	457
40,000	15,000	10 66	average	7 69	aver.	.....	.....	.....	12	....	12	12	458
10,000	3,000	12 00	8 25	6 00	4 80	2	....	2,000	yes	....	.....	.....	459
30,000	both	9 00	6 00	9 00	6 00	3	....	4,000	yes	....	.....	.....	460
1,638	384	12 00	9 00	.....	4 00	1	....	900	no	no	.....	.....	461
750	.....	10 00	average	.....	.....	.....	.....	.....	yes	....	.....	.....	462
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	.....	.....	463
1,404	3,200	15 00	12 00	7 00	.....	2	2	5,392	8	....	8	.....	464
750	.....	6 00	average	.....	.....	.....	.....	.....	.....	....	.....	.....	465
1,200	.....	6 00	average	.....	.....	.....	.....	.....	.....	....	.....	.....	466
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	.....	.....	467
3,000	2,400	13 00	9 00	10 00	5 00	....	....	.....	10	....	10	10	468
14,500	both	15 00	7 50	.....	.....	2	....	3,000	no	no	.....	.....	469
4,500	.....	18 00	12 00	.....	.....	1	....	1,500	10	....	10	10	470
1,500	1,000	9 00	.....	7 00	.....	.....	.....	.....	10	....	10	.....	471
9,200	3,300	12 00	7 50	9 00	5 40	....	1	500	10	....	10	.....	472
20,000	15,000	15 00	7 50	9 00	4 50	4	1	4,050	.....	....	.....	.....	473
2,800	3,300	15 00	7 50	6 60	3 50	....	....	.....	12	....	.....	.....	474

AND WOMEN'S UNDERWEAR.—TABLE NO. 17.

26,000	16,000	18 00	8 25	11 25	4 50	4	3	8,600	10	....	10	10	475
20,000	15,000	15 00	9 00	9 00	4 50	4	1	3,500	.....	....	.....	.....	476
3,500	6,000	15 00	10 00	10 00	7 00	2	1	4,000	.....	....	.....	.....	477
12,280	27,780	13 61	average	10 00	4 00	....	....	.....	.....	....	.....	.....	478
.....	624	.....	.....	4 08	av.	....	....	.....	no	no	.....	.....	479
26,000	18,000	16 50	11 25	8 25	6 00	4	3	7,500	yes	....	.....	.....	480
7,200	9,600	15 00	9 00	9 00	4 50	3	2	4,910	8	....	8	8	481
7,211	both	6 27	average	for	all	....	1	417	no	no	.....	.....	482
759,747	both	6 57	average	for	all	17	23	50,000	no	no	.....	.....	483
11,872	17,808	19 50	8 50	12 00	4 50	2	2	4,860	13	....	13	.....	484
3,439	10,319	12 75	7 50	5 40	3 60	3	....	2,400	15	....	15	.....	485
21,600	both	6 65	average	for	all	1	....	1,000	yes	....	.....	.....	486
11,467	both	6 55	average	for	all	....	....	.....	yes	....	.....	.....	487
600	550	9 00	.....	6 00	.....	.....	.....	.....	no	no	.....	.....	488
93,380	both	14 10	10 50	9 00	6 00	5	2	6,900	yes	....	.....	.....	489
29,440	both	.....	.....	.....	.....	2	1	.....	5	....	.....	.....	490
8,000	6,000	7 80	.....	4 20	.....	....	....	.....	.....	....	.....	.....	491
2,000	5,480	13 33	average	3 65	av.	....	1	80	no	no	.....	.....	492
19,947	both	8 03	average	for	all	3	1	3,960	no	no	.....	.....	493
4,300	10,250	13 00	11 00	6 50	4 75	....	....	.....	7½	....	7½	7½	494
.....	.....	.....	.....	.....	.....	4	3	.....	yes	....	.....	.....	495

RETURNS IN DETAIL

Clothing Factories, Men's and Women's

Office No.	Capital employed, including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
496	100,000	300	200,000	10	.....	320	1,200	1,600	.....	20	100
497	115,000	270	65,300	40½	.....	305	271	2,053	12,818	8	63
498	100,000	295	225,000	25	.....	148	1,801	.....	.....	38	60
499	48,000	300	200,000	10	.....	250	700	1,000	20,000	10	70
500	210,000	278	176,500	.....	16	496	493	4,050	11,300	14	40
501	350,000	300	205,000	14	.....	.....	.....	500	.....	10	75
502	40,000	280	200,000	10	.....	300	700	.....	16,000	10	60
503	15,000	225	70,000	20	.....	.....	150	300	200	13	17
504	150,000	302	215,000	.....	20	1,023	927	.....	.....	31	165
505	75,000	305	80,000	.....	15	238	119	2,874	.....	45	35
506	75,000	295	125,000	12½	.....	216	400	.....	4,712	15	65
507	62,000	290	88,000	no	no	1,400	750	800	20,000	40	20
508	100,000	300	250,000	.....	.....	394	815	.....	.....	60	40
509	20,000	300	100,000	20	.....	131	110	.....	.....	15	67
510	40,000	300	60,000	20	.....	.....	400	.....	.....	5	35
511	35,000	275	87,000	20	.....	70	490	910	.....	25	20
512	200,000	300	.....	.....	.....	328	.....	.....	.....	20	80
513	326,000	305	.....	5	.....	1,700	892	.....	.....	.....	.....
514	35,000	305	70,000	yes	.....	42	228	.....	.....	8	15
515	80,000	300	100,000	yes	.....	275	750	1,000	.....	60	50
516	.....	300	125,000	no	no	96	.....	.....	.....	4	35
517	131,250	300	348,000	10	.....	887	2,001	2,538	3,831	20	185

Boot and Shoe Manufacturers,

518	111,983	300	311,000	10	.....	784	1,320	.....	.....	101	48
519	210,000	278	176,500	.....	16	496	493	4,050	11,300	14	40
520	52,000	300	52,000	2½	.....	90	652	850	.....	30	10
521	37,100	290	71,100	15	.....	43	372	3,500	2,100	22	41
522	50,000	300	90,000	5	.....	.....	850	750	.....	35	10
523	40,000	303	170,000	.....	.....	164	519	.....	.....	50	25
524	545,172	284	1,133,598	27	.....	1,264	413	33,443	81,039	289	193
525	80,000	300	310,000	10	.....	.....	1,400	.....	.....	100	50
526	193,100	300	265,000	.....	4½	849	2,835	4,300	.....	100	30
527	111,983	300	311,000	10	.....	784	1,320	473	.....	101	48
528	35,000	280	49,000	10	.....	100	800	.....	.....	15	10
529	35,000	305	84,000	33⅓	.....	90	225	1,200	.....	43	22
530	250,000	300	62,852	.....	7½	316	1,307	2,000	.....	30	10
531	75,000	305	460,000	27	.....	40	588	1,275	.....	95	18
532	3,000	305	6,000	no	no	33	28	.....	.....	3	1
533	25,000	305	50,000	20	.....	1,000	250	1,000	4,000	12	4
534	100,000	300	135,000	10	.....	190	675	750	.....	60	35
535	700,000	300	1,000,000	25	.....	799	1,486	25,000	630,000	135	121
536	25,000	300	60,000	no	no	297	800	.....	.....	24	1
537	40,000	300	200,000	no	no	300	600	15,000	.....	65	25
538	74,000	276	123,555	5	.....	228	955	12,097	.....	44	15
539	52,600	300	88,000	.....	10	111	299	.....	.....	50	36
540	1,000	100	1,200	25	.....	40	.....	75	200	4	1
541	75,000	300	152,000	.....	25	124	1,083	500	.....	60	15
542	40,000	305	60,000	40	.....	125	300	1,500	.....	25	15

FROM MANUFACTURERS.

WHITEWEAR, MILLINERY, ETC.—TABLE No. 18.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
10,000	40,000	12 00	.....	6 00	.....	4	5	10,000	10	....	10	10	496
3,024	13,491	15 00	10 00	7 00	5 00	10	16	34,572	16⅔	....	.....	.....	497
13,275	12,000	12 00	6 00	9 00	5 00	4	3	6,683	no	no	.....	.....	498
5,000	25,000	12 00	6 00	8 50	5 00	8	1	9,000	10	....	10	10	499
19,947	both	8 03	average	for	all	3	1	3,960	no	no	.....	.....	500
5,000	20,000	12 00	8 00	14 00	4 00	2	1	2,500	no	no	.....	.....	501
6,500	21,500	14 00	6 00	9 00	5 00	10	1	10,000	5	....	5	6	502
6,500	5,950	15 00	10 00	9 00	5 00	5	1	5,800	10	....	10	10	503
58,800	both	6 03	average	for	all	15	11	19,525	.....	yes	.....	.....	504
19,139	8,202	8 34	average	4 60	av.	5	....	8,000	yes	....	.....	.....	505
34,189	both	8 72	average	for	all	4	1	4,650	no	no	.....	.....	506
22,500	5,500	11 71	average	5 73	av.	8	2	9,000	no	no	.....	.....	507
35,000	15,000	11 67	average	7 50	av.	....	....	.....	5	....	.....	.....	508
6,600	20,100	15 00	6 00	7 50	4 50	4	....	4,700	3	....	3	.....	509
4,000	10,000	15 00	.....	5 50	.....	2	1	.....	no	no	.....	.....	510
9,550	4,300	10 50	8 10	9 00	6 00	5	....	7,000	10	....	10	.....	511
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	512
.....	.....	.....	.....	.....	.....	....	....	.....	10	....	10	10	513
.....	.....	.....	.....	.....	.....	1	1	1,500	yes	....	.....	.....	514
30,000	15,000	18 00	10 50	6 90	.....	4	....	.....	yes	....	.....	.....	515
2,000	10,000	10 00	average	5 71	av.	....	....	.....	.....	....	.....	.....	516
76,619	both	21 00	9 00	13 50	6 00	5	3	8,500	no	no	.....	.....	517

FELT FOOTWEAR.—TABLE No. 19.

63,375	16,425	12 55	average	6 84	av.	13	2	16,088	5	....	5	5	518
19,947	both	8 03	average	for	all	3	1	3,960	no	no	.....	.....	519
13,000	2,600	13 50	7 00	8 00	4 25	2	5	3,600	3	....	3	.....	520
9,853	12,135	16 50	9 00	10 00	4 50	3	2	4,212	no	no	.....	.....	521
14,147	3,000	12 00	7 50	7 50	5 25	....	....	.....	10	....	.....	.....	522
25,546	4,348	12 00	average	7 50	.....	1	....	2,000	no	no	.....	.....	523
133,529	53,852	15 75	9 00	5 70	5 55	16	7	18,427	yes	....	.....	.....	524
71,300	both	9 50	average	for	all	5	3	.....	10	....	.....	.....	525
54,000	both	8 31	average	for	all	2	3	3,300	.....	6	.....	.....	526
63,375	16,425	12 55	average	6 84	av.	13	2	16,088	5	....	5	5	527
7,500	2,500	12 00	7 50	5 40	4 80	1	0	1,000	10	....	10	.....	528
17,000	6,000	18 00	6 50	10 00	3 00	1	1	1,500	no	no	.....	.....	529
13,879	both	15 00	5 00	7 00	av.	1	1	.....	5	....	5	.....	530
40,000	10,000	15 00	9 00	9 00	4 50	2	1	3,065	.....	....	.....	.....	531
900	200	10 00	.....	.....	3 00	....	....	.....	10	....	.....	.....	532
9,000	1,850	18 00	.....	9 75	.....	4	....	3,000	10	....	10	10	533
21,994	13,180	7 33	average	7 50	av.	7	5	10,000	no	no	.....	.....	534
68,260	39,563	14 70	10 80	6 90	6 60	6	23	28,000	6	....	6	6	535
8,000	300	15 00	7 50	6 00	.....	1	....	2,500	.....	....	.....	.....	536
22,000	8,000	13 50	9 00	9 00	6 00	2	1	3,000	.....	....	.....	.....	537
17,810	4,990	18 00	9 00	9 00	4 50	2	....	3,400	8	....	5	.....	538
20,100	9,136	25 00	3 50	5 07	av.	2	2	3,328	10	....	10	.....	539
800	100	10 00	7 00	6 00	.....	....	....	.....	5	....	.....	.....	540
27,250	4,000	15 00	7 50	12 75	4 50	3	....	2,500	.....	....	.....	.....	541
14,000	7,000	15 00	6 00	9 00	4 20	3	....	4,000	1..	....	1	1	542

RETURNS IN DETAIL

Fur Manufacturers, Dressers and Dyers:

Office No.	Capital employed including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year. Increased.	Production during year. Decreased.	Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only. Male.	Total No. of employees, wage-earners only. Female.
	$		$	%	%	$	$	$	$		
543	120,000	313	240,000	12	.....	160	1,200	500	12,600	65	15
544	28,700	303	89,000	18	.....	181	527	2,000	.....	18	30
545	12,000	300	26,000	25	.....	200	300	1,000	.....	30	.....
546	17,500	305	40,000	no	no	71	150	.....	.....	6	3
547	10,000	300	12,000	no	no	13	20	.....	.....	.....	.....
548	50,000	300	160,000	10	.....	110	120	.....	.....	75	45

Tanneries, Harness and Leather

549	102,700	305	106,663	12	.....	450	1,645	2,500	8,415	35	1
550	1,286,000	308	1,080,000	6½	.....	.....	.....	53,122	.....	250	.....
551	90,000	300	190,000	12	.....	425	800	950	1,500	45	24
552	100,000	295	200,000	no	no	148	1,801	.....	.....	30	47
553	150,000	300	148,344	.....	45	320	2,949	6,731	.....	25	.....
554	40,000	300	71,432	6	.....	100	781	1,000	.....	13	.....
555	400,000	300	800,000	10	.....	867	5,711	15,000	80,638	150	100
556	730,604	311	792,000	6	.....	.....	.....	.....	.....	100	.....
557	380,000	308	530,000	10	.....	.....	.....	.....	.....	125	.....
558	14,000	312	25,000	.....	10	100	350	.....	.....	3	.....
559	4,000	300	5,000	.....	.....	142	38	.....	.....	2	.....
560	10,000	305	8,000	no	no	25	50	350	.....	3	.....
561	185,000	300	245,000	17½	.....	800	450	13,450	1,700	120	12
562	75,000	270	130,000	10	.....	360	1,050	.....	99,753	23	.....
563	15,000	300	20,000	10	.....	290	62	.....	108	4	3
564	40,000	300	42,000	.....	.....	152	189	.....	2,516	16	.....
565	1,100,000	310	2,000,000	50	.....	2,800	6,600	15,000	25,000	200	2
566	50,000	310	55,000	15	.....	360	332	.....	.....	22	.....
567	20,000	300	80,000	10	.....	98	249	632	8,783	20	23
568	85,000	300	127,500	10	.....	139	686	2,219	.....	26	.....
569	14,331	285	62,628	33⅓	.....	121	102	.....	1,609	18	27
570	9,000	300	10,000	no	no	36	83	.....	.....	1	.....
571	5,000	300	2,500	no	no	35	.....	.....	.....	3	.....
572	3,000	300	9,000	yes	.....	66	18	.....	150	6	2
573	200,000	300	500,000	9	.....	2,000	600	6,000	.....	190	70
574	50,000	300	60,000	no	no	1,000	500	.....	.....	25	1

Flour and Feed Mills; Cereal

575	700,000	300	1,700,000	10	.....	3,000	4,000	5,000	.....	42	5
576	200,000	300	1,000,000	no	no	1,250	2,500	.....	.....	35	2
577	106,000	300	450,000	no	no	1,000	650	20,000	.....	25	.....
578	1,650,000	312	4,472,355	.....	4½	.....	10,395	30,351	98,598	225	213
579	350,000	305	650,000	no	no	1,300	4,000	.....	45,000	40	2
580	20,000	300	30,000	yes	.....	94	150	.....	160	3	.....
581	9,000	300	6,000	no	no	54	110	100	.....	4	.....
582	18,000	300	50,000	15	.....	125	130	500	250	6	.....

FROM MANUFACTURERS.

HAT AND CAP FACTORIES.—TABLE No 20.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
37,000	6,300	16 10	10 00	9 00	5 00	4	2	9,240	25	....	.....	.....	543
10,000	10,200	15 75	10 50	10 50	5 00	3	1	5,600	15	....	15	15	544
16,000	.....	15 00	12 00	.....	.....	....	....	.....	10	....	10	10	545
4,800	1,250	22 50	6 50	11 00	4 50	1	....	800	yes	....	.....	.....	546
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	547
30,000	10,000	15 00	9 00	9 00	6 00	2	....	3,500	yes	....	.....	.....	548

GOODS FACTORIES.—TABLE No. 21.

22,045	420	15 90	10 20	8 20	.....	3	2	9,054	3	....	3	3	549
121,780	.....	15 00	9 00	.....	.....	6	2	7,154	.....	....	.....	.....	550
26,400	6,500	16 00	9 00	6 50	4 00	2	....	1,400	5	....	5	5	551
13,275	11,875	12 00	6 00	9 00	5 00	4	3	6,683	no	no	.....	.....	552
13,075	.....	10 50	9 00	.....	.....	1	....	572	no	no	.....	.....	553
5,620	.....	10 50	8 00	.....	.....	....	....	.....	6	....	6	.....	554
76,200	25,204	10 16	average	5 04	av.	200	100	125,406	7½	....	7½	.....	555
50,160	.....	10 50	.....	.....	.....	5	2	5,735	6	....	6	.....	556
73,000	.....	15 00	9 00	.....	.....	3	1	.....	.....	....	.....	.....	557
1,500	.....	12 00	10 75	.....	.....	....	....	.....	5	....	5	5	558
720	.....	10 00	4 00	.....	.....	....	....	.....	.....	....	.....	.....	559
2,000	.....	12 00	.....	.....	.....	....	....	.....	no	no	.....	.....	560
40,000	4,000	16 50	8 50	7 50	4 50	7	3	6,800	12½	....	.....	.....	561
10,000	.....	15 00	11 40	.....	.....	2	1	3,000	5	....	5	.....	562
1,950	875	13 50	8 10	7 50	6 00	....	....	.....	10	....	10	.....	563
5,880	.....	12 00	average	.....	.....	2	1	2,264	.....	....	.....	.....	564
110,000	700	15 75	11 25	6 86	.....	16	2	30,000	12½	....	12½	12½	565
12,100	.....	11 00	average	.....	.....	6	....	5,460	5	....	5	5	566
9,000	5,500	18 60	7 20	9 00	4 80	5	1	6,500	5	....	5	5	567
10,278	.....	12 00	9 75	.....	.....	1	....	2,000	no	no	.....	.....	568
6,408	6,835	16 00	4 00	6 50	2 50	3	1	3,912	.....	....	.....	.....	569
300	.....	6 00	.....	.....	.....	1	....	300	no	no	.....	.....	570
1,152	.....	7 68	average	.....	.....	....	....	.....	.....	....	.....	.....	571
2,600	450	8 50	.....	5 00	.....	....	....	.....	yes	....	.....	.....	572
75,000	20,000	18 00	10 80	9 00	5 40	3	3	5,500	10	....	10	10	573
12,000	both	15 00	10 00	6 00	.....	....	1	2,000	10	....	10	10	574

FOOD FACTORIES.—TABLE No. 22.

30,000	2,500	21 00	12 00	10 00	.....	8	....	.....	10	....	10	10	575
21,000	700	13 50	10 50	7 00	.....	2	....	1,809	no	no	.....	.....	576
12,000	.....	15 00	10 50	.....	.....	4	2	.....	10	....	10	10	577
110,000	35,500	13 95	8 55	7 80	4 95	19	4	38,965	.....	....	.....	.....	578
20,000	800	30 00	10 50	12 00	.....	4	2	6,000	yes	....	.....	.....	579
1,300	.....	9 50	6 50	.....	.....	....	....	.....	no	no	.....	.....	580
1,560	.....	8 00	.....	.....	.....	....	....	.....	no	no	.....	.....	581
2,850	.....	9 50	.....	.....	.....	....	....	.....	10	....	.....	.....	582

RETURNS IN DETAIL

Flour and Feed Mills; Cereal

Office No.	Capital employed, including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
583	10,000	300	.....	10	.....	72	60	1,000	.....	3	.....
584	30,000	312	50,000	yes	.....	120	180	200	.....	3	.....
585	.....	307	107,827	3	.....	237	558	.....	.....	5	1
586	.....	307	91,165	2	.....	143	756	.....	.....	5	1
587	70,000	305	188,000	no	no	363	314	486	.....	14	.....
588	90,000	305	450,000	no	no	425	900	1,000	.....	17	3
589	60,000	300	163,991	4	.....	426	775	403	741	17	.....
590	26,375	300	90,508	20	.....	150	275	352	150	5	.....
591	13,000	295	45,000	yes	.....	34	330	500	.....	4	.....
592	20,000	305	.....	no	no	250	180	.....	.....	3	.....
593	15,000	310	.....	yes	.....	153	100	1,200	.....	4	1
594	12,000	305	15,000	10	.....	130	108	600	.....	2	.....
595	10,000	300	.....	no	no	72	60	500	.....	4	.....
596	1,000	300	.....	.....	yes	23	15	.....	.....	.....	.....
597	25,000	300	40,000	no	no	90	150	200	.....	4	.....
598	5,000	312	39,360	5	.....	60	52	500	.....	1	.....
599	50,000	300	65,000	no	no	250	1,200	1,500	.....	7	1
600	35,000	313	131,311	.....	.....	234	528	593	.....	7	.....
601	6,500	....	.....	.....	.....	38	65	.....	200	.....	.....
602	20,000	305	50,000	.....	.....	160	231	400	.....	4	.....
603	25,000	305	50,000	no	no	375	300	.....	500	3	.....
604	25,000	300	40,000	no	no	86	400	500	900	3	.....
605	15,000	305	25,000	no	no	50	175	600	.....	2	.....
606	32,000	70	17,850	no	no	67	146	.....	.....	4	.....
607	15,000	300	40,000	no	no	40	250	.....	.....	3	.....
608	18,000	305	55,000	.....	1	218	156	.....	25	3	.....
609	20,000	250	.....	no	no	53	44	.....	.....	2	.....
610	50,000	310	100,000	10	.....	300	700	100	.....	7	.....
611	30,000	300	142,000	.....	30	170	480	.....	1,200	5	.....
612	50,000	300	34,000	no	no	315	64	.....	.....	3	.....
613	9,000	300	35,000	no	no	42	104	.....	.....	1	.....
614	45,000	300	225,000	10	.....	187	750	.....	.....	15	.....
615	100,000	305	450,327	65	.....	125	2,650	6,071	300	16	2
616	60,000	310	275,000	5	.....	490	1,120	.....	.....	11	.....
617	300,000	300	600,000	no	no	1,600	3,500	.....	5,000	25	.....
618	50,000	300	109,173	.....	½	718	1,066	.....	4,449	9	.....
619	15,000	300	42,058	1	.....	120	224	500	4,236	7	.....
620	50,000	300	150,000	10	.....	450	500	3,500	275	10	.....
621	3,500	300	31,250	no	no	125	.....	.....	.....	2	.....
622	29,000	290	89,000	5	.....	265	352	.....	.....	7	1
623	39,000	312	135,000	no	no	320	454	650	.....	9	1
624	40,000	313	200,000	.....	2	140	550	.....	800	8	1
625	157,500	305	560,000	.....	.....	1,065	1,537	1,100	.....	26	3
626	3,000	200	.....	.....	yes	40	.....	.....	.....	1	.....
627	8,500	300	13,720	no	no	45	177	800	.....	2	.....
628	6,000	120	5,000	no	no	22	45	20	.....	1	.....
629	65,000	300	72,918	no	no	260	1,011	390	.....	6	1
630	44,000	300	344,110	no	no	113	1,707	.....	1,346	15	1
631	50,000	300	240,000	no	no	241	832	.....	.....	10	2
632	16,000	305	12,000	.....	15	75	218	.....	.....	2	.....
633	3,500	300	.....	10	.....	41	32	.....	48	1	.....
634	15,000	310	30,000	20	.....	95	180	600	.....	2	.....
635	38,234	305	46,328	15½	.....	32	178	.....	12,629	3	5
636	50,000	295	65,000	10	.....	175	250	1,000	.....	8	1
637	4,000	300	.....	.....	.....	67	40	.....	.....	2	.....

FROM MANUFACTURERS.

FOOD FACTORIES.—TABLE No. 22—Continued,

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c	$ c.	$ c.			$	%	%	%	%	
1,000	.....	10 00	8 00	.....	.....	....	....	.....	no	no	.....	.....	583
2,000	.....	12 82	average	.....	.....	....	....	.....	no	no	.....	.....	584
3,452	325	13 54	average	6 50	.....	....	....	.....	.....	....	.....	.....	585
2,546	392	10 00	average	7 70	.....	....	....	.....	.....	....	.....	.....	586
8,370	.....	13 20	10 80	.....	.....	3	1	3,950	no	no	.....	.....	587
11,000	both	15 00	12 00	9 00	.....	2	3	3,200	15	....	15	15	588
5,740	.....	13 50	10 50	.....	.....	3	....	3,000	no	no	.....	.....	589
2,506	.....	10 02	average	.....	.....	1	1	1,420	.....	....	.....	.....	590
2,000	.....	10 20	average	.....	.....	....	....	.....	yes	....	.....	.....	591
1,250	.....	10 00	7 00	.....	.....	....	....	.....	yes	....	.....	.....	592
1,775	260	8 70	average	5 10	.....	....	....	.....	yes	....	.....	.....	593
900	.....	9 00	average	.....	.....	....	....	.....	.....	....	.....	.....	594
1,200	.....	10 00	7 00	.....	.....	....	....	.....	no	no	.....	.....	595
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	596
2,200	.....	10 50	.....	.....	.....	....	1	100	no	no	.....	.....	597
500	.....	10 00	.....	.....	.....	....	....	.....	10	....	10	.....	598
3,700	400	13 00	9 50	8 00	.....	....	1	400	5	....	.....	.....	599
3,489	.....	18 00	11 25	.....	.....	2	....	2,500	no	no	.....	.....	600
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	601
1,200	.....	9 00	average	.....	.....	....	....	.....	.....	....	.....	.....	602
1,800	.....	12 00	average	.....	.....	1	....	1,000	no	no	.....	.....	603
1,470	.....	12 00	9 00	.....	.....	3	....	2,340	10	....	10	.....	604
760	.....	10 00	8 00	.....	.....	....	....	.....	no	no	.....	.....	605
540	.....	18 00	9 00	.....	.....	....	....	.....	.....	....	.....	.....	606
1,510	.....	10 00	.....	.....	.....	....	....	.....	.....	....	.....	.....	607
1,400	.....	12 00	9 00	.....	.....	....	....	.....	no	no	.....	.....	608
500	.....	15 00	7 50	.....	.....	1	....	500	no	no	.....	.....	609
4,200	.....	12,00	.....	.....	.....	....	....	.....	2	....	.....	2	610
4,700	.....	18 00	10 00	.....	.....	2	....	1,200	no	no	.....	.....	611
1,664	.....	12 00	10 00	.....	.....	....	....	.....	no	no	.....	.....	612
450	.....	.....	7 50	.....	.....	....	....	.....	no	no	.....	.....	613
.....	.....	12 00	9 00	.....	.....	1	....	800	no	no	.....	.....	614
12,606	1,200	15 45	average	14 00	6 00	2	2	4,120	5	....	5	5	615
7,000	.....	12 24	average	.....	.....	3	2	4,150	10	....	10	.....	616
18,000	.....	18 00	12 00	.....	.....	3	3	4,000	20	....	20	.....	617
5,074	.....	14 25	9 75	.....	.....	2	....	2,700	6½	....	6½	.....	618
2,776	.....	10 00	6 25	.....	.....	....	....	.....	yes	....	.....	.....	619
5.170	.....	14 00	10 00	.....	.....	2	1	2,200	12½	. ..	12½	12½	620
1,075	.....	13 50	7 50	.....	.....	....	....	.....	no	no	.....	.....	621
4,986	260	14 00	9 50	.....	5 25	2	....	2,000	10	....	10	.....	622
4,350	416	18 00	10 00	8 00	.....	2	....	2,500	no	no	.....	.....	623
4,700	300	12 00	10 50	.....	6 00	2	1	2,700	10	....	10	10	624
11,000	1,600	16 00	10 50	10 46	.....	2	3	5,000	10	....	.....	.....	625
.....	.....	.....	.....	.....	.....	....	....	.....	no	no	.....	.....	626
750	.....	.....	7 50	.....	.....	....	....	.....	no	no	.....	.....	627
100	.....	.....	6 00	.....	.....	....	....	.....	no	no	.....	.....	628
3,000	260	10 00	10 00	.....	5 20	....	1	260	no	no	.....	.....	629
5,926	750	18 00	10 00	15 00	.....	1	....	4,000	no	no	.....	.....	630
10,024	900	20 00	average	9 00	av.	1	2	1,900	no	no	.....	.....	631
1,200	.....	11 76	average	.....	.....	....	....	.....	no	no	.....	.....	632
360	.....	7 20	.....	.....	.....	....	....	.....	no	no	.....	.....	633
936	.....	.....	9 00	.....	.....	....	....	.....	no	no	.....	.....	634
1,023	683	.....	9 00	.....	5 00	10	5	11,132	10	....	10	10	635
5,000	400	12 00	.....	6 00	.....	....	....	.....	yes	....	.....	.....	636
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	637

RETURNS IN DETAIL

FLOUR AND FEED MILLS: CEREAL

Office No.	Capital employed including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
638	20,000	200	50,000	.....	.....	265	373	.....	.....	6	.....
639	10,000	300	15,000	no	no	253	400	.....	.....	3	.....
640	175,000	300	300,000	no	no	642	3,367	10,000	2,141	22	1
641	80,000	305	60,000	20	.....	250	300	600	.....	4	.....
642	34,000	300	13,400	.....	.....	120	584	.....	.....	5	.....
643	7,000	305	.....	no	no	38	70	.....	.....	.....	.....
644	150,000	300	300,000	.....	.....	650	2,600	.....	.....	10	2
645	20,000	305	40,000	5	.....	100	150	200	.....	2	....
646	15,000	305	45,000	no	no	38	308	600	232	3	.....
647	10,550	174	5,200	.....	27¾	14	215	100	530	2	.....
648	2,500	180	1,000	.....	.....	78	183	.....	50	1	.....
649	32,500	300	45,500	no	no	153	112	500	.....	6	.....
650	75,000	312	.....	.....	.....	.....	.....	.....	.....	15	1
651	45,000	300	145,000	15	.....	246	316	.....	6,013	6	.....
652	13,000	305	47,800	8	.....	49	137	.....	.....	2	.....
653	35,000	280	60,000	15	.....	767	503	.....	867	5	.....
654	50,000	300	100,000	10	.....	700	1,000	500	.....	10	2
655	35,000	300	93,500	no	no	70	571	.....	.....	5	.....
656	75,000	305	110,000	10	.....	700	638	250	.....	7	.....
657	90,000	306	205,174	37½	.....	636	1,444	.....	3,602	19	1
658	22,500	310	50,000	50	.....	230	550	450	340	6	1

BAKERS, BREAD AND BISCUIT, AND

659	10,000	312	25,000	10	.....	15	30	.....	.....	3	4
660	50,000	290	95,000	5	.....	457	758	17	6,450	8	18
661	60,000	290	215,000	5	.....	360	1,033	.....	.....	40	45
662	100,000	305	303,000	23	.....	199	700	1,700	.....	30	8
663	216,887	282	350,000	15	.....	494	1,579	15,000	151,000	43	22
664	75,000	300	144,000	8	.....	417	449	1,500	.....	20	29
665	.....	300	700,000	.....	.....	3,400	1,600	.....	35,000	150	200
666	55,000	300	90,000	10	.....	178	375	400	11,134	29	48
667	40,000	305	147,437	.....	yes	439	381	.....	.....	58	3

CANNING, PORK PACKING, BACON CURING,

668	21,000	305	8,000	no	no	69	125	750	200	7	.....
669	104,300	305	1,500,000	13	.....	2,081	2,000	.....	.....	80	.....
670	111,312	310	145,453	8	.....	165	500	4,529	81,619	50	80
671	164,134	96	106,006	.....	33⅓	825	800	2,375	61,756	90	80
672	.....	158	53,317	no	no	340	.....	.....	.....	70	130
673	8,000	85	7,250	.....	30	30	.....	300	.....	10	18
674	236,088	150	250,000	50	.....	280	.....	.....	2,500	145	149
675	4,290,000	150	130,000	25	.....	475	.....	6,000	.....	50	80
676	11,000	60	46,734	yes	.....	34	475	1,225	.....	30	72
677	150,000	305	175,000	7	.....	300	1,200	8,000	12,000	25	75
678	150,000	300	1,000,000	6	.....	620	3,100	.....	.....	60	.....
679	100,000	150	120,000	no	no	243	.....	5,000	.....	75	100
680	20,000	305	120,000	20	.....	16	7,000	.....	.....	25	.....
681	600,000	300	5,000,000	10	.....	4,200	5,500	50,000	.....	200	.....
682	100,000	313	749,000	9	.....	672	449	550	7,670	35	1

FROM MANUFACTURERS.

FOOD FACTORIES.—TABLE NO. 22.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
3,500	.....	15 00	9 00	.....	.....	....	....	.....	no	no	.....	.....	638
1,500	.....	10 00	average	.....	.....	....	....	.....	.....	....	.....	.....	639
9,368	500	13 50	9 00	10 00	.....	2	1	3,500	no	no	.....	.....	640
1,800	.....	9 00	.....	.....	.....	....	....	.....	10	....	10	.....	641
2,880	.....	14 25	10 50	.....	.....	....	....	.....	no	no	.....	.....	642
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	243
7,500	700	15 00	9 60	6 60	.....	2	....	2,500	5	....	5	.....	644
1,236	.....	12 00	9 00	.....	.....	....	....	.....	no	no	.....	.....	645
1,500	.....	12 00	9 00	.....	.....	....	....	.....	no	no	.....	.....	646
603	.....	13 20	8 40	.....	.....	....	....	.....	4	....	4	.....	647
.....	.....	.....	.....	.....	.....	....	....	.....	.....	....	.....	.....	648
3,000	.....	12 00	8 50	.....	.....	....	....	.....	yes	....	.....	.....	649
8,000	.....	.....	.....	.....	.....	1	1	.....	yes	....	.....	.....	650
3,297	.....	12 00	10 00	.....	.....	2	1	2,652	no	no	.....	.....	651
985	.....	.....	10 20	.....	.....	....	....	.....	.....	....	.....	.....	652
2,750	.....	13 00	10 00	.....	.....	1	1	1,760	no	no	.....	.....	653
6,000	750	12 00	10 00	7 50	.....	1	2	4,000	5	....	.....	5	654
2,500	.....	12 00	9 60	.....	.....	....	....	.....	5	....	5	5	655
4,500	.....	20 00	11 50	.....	.....	2	2	1,320	no	no	.....	.....	656
10,313	.....	10 86	average	.....	6 00	2	1	2,800	no	no	.....	.....	657
4,200	500	15 00	9 00	10 00	.....	1	1	2,000	10	....	.....	.....	658

CONFECTIONERS.—TABLE NO. 23.

3,000	2,000	21 00	10 00	9 00	5 00	....	....	.....	5	....	5	5	659
9,370	both	19 50	9 45	8 50	3 75	7	1	7,432	10	....	10	10	660
20,736	both	18 00	8 00	.....	.....	11	3	10,435	5	....	.....	.....	661
21,000	both	10 83	average	for	all	2	1	4,500	no	no	.....	.....	662
21,600	5,200	10 69	average	5 03	av.	....	....	.....	yes	....	yes	.....	663
12,116	4,232	13 20	9 00	8 40	4 80	5	2	8,000	5	....	5	.....	664
50,000	65,000	15 00	8 00	7 00	5 00	4	12	10,000	.....	....	.....	.....	665
12,595	6,155	18 50	8 50	6 00	3 50	5	1	3,016	10	....	10	10	666
31,529	1,352	10 66	average	8 85	av.	2	3	3,752	no	no	.....	.....	667

ABATTOIRS, ETC.—TABLE NO. 24.

1,800	.....	13 50	9 00	.....	.....	1	....	450	no	no	.....	.....	668
33,000	.....	12 00	10 00	.....	.....	7	....	17,000	5	....	5	5	669
8,000	4,000	13 50	9 00	7 50	4 50	3	....	3,000	10	....	.....	.....	670
9,756	2,600	13 50	9 75	.....	4 50	1	3	2,554	no	no	.....	.....	671
14,280	4,209	13 50	9 00	6 00	4 80	3	1	4,084	no	no	.....	.....	672
850	1,050	12 00	9 75	.....	3 24	....	....	.....	20	....	.....	.....	673
27,465	both	12 00	9 00	6 00	4 50	1	2	2,308	6	....	6	.....	674
20,366	both	13 50	9 75	6 25	5 40	3	1	3,200	15	....	15	.....	675
4,520	2,176	18 00	10 50	7 50	.....	1	....	1,500	yes	....	.....	.....	676
10,000	15,000	19 50	10 50	6 00	4 50	2	....	4,000	15	....	15	.....	677
32,300	.....	16 00	10,00	.....	.....	2	4	5,000	no	no	.....	.....	678
8,200	3,100	13 50	9 00	7 50	5 10	2	1	3,000	8	....	8	.....	679
10,000	.....	20 00	12 00	.....	.....	3	....	5,000	no	no	.....	.....	680
110,000	.....	18 00	12 00	.....	.....	30	10	40,000	yes	....	.....	.....	681
20,687	.....	14 50	12 00	10 00	.....	11	....	6,757	6	....	6	6	682

RETURNS IN DETAIL

CANNING, PORK PACKING, BACON CURING,

Office No.	Capital employed including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
683	18,000	90	40,000	50	.....	6	462	500	800	25	35
684	18,500	90	20,000	no	no	23	130	.....	100	35	35
685	104,105	150	104,531	140	.....	130	500	1,261	78,244	35	75
686	70,551	167	67,574	70	.....	221	350	58	33,620	25	100
687	67,525	140	56,861	40	.....	57	400	95	36,053	25	45
688	77,656	140	62,271	70	.....	85	450	2,169	39,490	30	68
689	500,000	305	2,723,495	yes	.....	1,028	7,198	6,000	.....	151	2
690	.....	100	30,000	40	.....	85	.....	1,000	.....	40	65
691	75,000	150	75,000	80	.....	172	911	1,660	.....	15	8
692	558,922	300	999,465	11	.....	691	1,863	20,488	722,617	240	160
693	30,000	150	60,000	20	.....	100	.....	1,000	.....	15	75
694	40,000	85	50,000	.....	5	196	500	4,000	35	.....	.....
695	97,687	144	54,626	.....	20	257	600	2,185	38,859	42	45

DAIRY PRODUCTS AND OTHER

696	20,240	313	65,095	.....	yes	99	98	500	1,500	4	.....
697	5,000	40	3,600	no	no	86	200	100	.....	13	.....
698	100,000	305	120,000	no	no	1,200	1,100	1,000	35,000	22	36
699	4,500	313	15,000	no	no	65	78	.....	.....	5	1
700	760,000	280	433,718	no	no	1,600	6,000	.....	.....	104	11
701	.....	50	10,000	.....	25	500	1,100	.....	.....	43	.....
702	250,000	305	599,581	15	.....	795	39	4.904	539,507	85	40
703	30,000	305	130,000	10	.....	650	908	275	3,800	10	10
704	20,000	305	770,000	20	.....	2,376	500	14,500	80,000	50	105
705	6,000	305	14,000	.....	20	110	40	.....	.....	1	.....
706	.....	312	570,000	10	.....	.....	.....	.....	.....	35	17
707	9,000	300	30,600	7	.....	57	156	.....	.....	3	4
708	32,000	305	21,090	4	.....	148	110	.....	.....	14	.....
709	80,000	305	300,000	20	.....	800	500	15,000	.....	30	25
710	2,500	200	14,517	5	.....	8	18	.....	.....	3	.....
711	40,000	220	12,449	no	no	75	122	700	.....	10	.....
712	40,000	235	25,287	50	.....	230	335	.....	.....	32	.....
713	8,000	313	57,952	no	no	49	99	150	2,000	4	1
714	10,600	90	200,000	.....	$33\frac{1}{3}$	60	88	2,000	.....	4	.....
715	200,000	305	283,621	yes	.....	727	1,765	2,000	.....	30	10

BREWERIES, DISTILLERIES AND WINE FACTORIES;

716	66,000	300	96,500	5	.....	75	350	.....	16,000	50	50
717	150,000	300	200,000	$33\frac{1}{3}$	.....	530	1,011	300	.....	40	95
718	10,000	325	77,000	.....	.....	86	200	.....	.....	40	8
719	75,000	300	70,000	no	no	380	560	.....	.....	12	1
720	9,000	313	30,000	.....	.....	131	66	.....	.....	9	.....
721	35,000	305	3,000	.....	50	310	226	.....	.....	4	.....
722	10,000	300	25,000	10	.....	600	200	1,000	1,000	7	.....
723	100,000	300	111,580	$7\frac{3}{4}$	.....	254	1,594	1,100	.....	13	.....
724	1,600,000	312	462,000	$10\frac{1}{2}$	.....	21,206	26,860	.....	.....	180	.....
725	65,000	300	96,000	6	.....	73	350	.....	12,000	50	50
726	10,000	305	16,000	no	no	260	175	.....	.....	5	.....
727	15,000	305	20,000	no	no	147	177	.....	.....	6	.....

FROM MANUFACTURERS.

ABATTOIRS, ETC.—TABLE No. 24.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
2,000	2,000	15 00	12 00	9 00	6 00	2	....	1,000	10	....	10	10	683
2,100	1,000	12 00	9 00	6 00	4 80	2	....	700	no	no	.....	.....	684
5,786	8,679	11 25	8 25	6 00	5 40	1	1	753	no	no	.....	.....	685
6,303	both	16 50	10 50	9 00	6 00	2	1	1,980	25	....	25	.....	686
7,534	both	15 00	10 50	12 00	4 80	2	....	1,800	12½	....	12½	.....	687
3,960	6,082	15 00	10 50	6 00	5 10	2	....	2,200	12½	....	12½	.....	688
63,209	1,000	13 50	9 75	6 00	.....	12	2	31,120	10	....	.....	10	689
3,000	1,200	11 25	9 00	6 00	.....	1	....	200	no	no	.....	.....	690
6,750	1,800	9 00	.....	.....	4 50	3	1	3,500	10	....	10	.....	691
46,483	30,471	13 50	10 50	9 00	5 40	8	3	14,443	10	....	10	.....	692
13,000	both	15 00	10 50	7 50	6 00	2	1	2,750	10	....	10	.....	693
.....	.....	15 00	10 50	7 50	.....	2	1	2,330	6	....	6	6	694
6,093	1,179	15 25	6 75	6 00	4 50	2	....	2,290	12½	....	12½	12½	695

FOODS.—TABLE No. 25.

1,800	.....	10 00	average	.....	.....	....	1	600	20	....	20	20	696
1,000	.....	11 00	average	.....	.....	....	....	.....	no	no	.....	.....	697
15,000	both	17 50	8 50	7 25	4 00	....	....	.....	.....	....	.....	.....	698
1,675	40	15 00	12 00	.....	5 00	....	....	.....	no	no	.....	.....	699
69,447	4,000	14 20	average	7 74	aver.	8	2	.....	7½	....	7½	7½	700
3,600	.....	12 00	5 00	.....	.....	1	....	600	no	no	.....	.....	701
45,581	12,527	24 00	10 50	8 10	6 60	1	1	1,220	20	....	20	.....	702
5,800	2,500	15 00	8 25	5 50	3 50	3	2	4,720	7	....	.....	.....	703
23,000	20,000	15 00	9 00	7 00	4 00	10	2	28,000	35	....	35	.....	704
700	.....	13 73	.....	.....	.....	....	....	.....	.....	....	.....	.....	705
24,000	both	8 80	average	for	all	1	1	.....	yes	....	.....	.....	706
1,430	1,200	12 00	3 50	6 00	.....	2	1	2,300	.....	....	.....	.....	707
5,860	.....	11 10	9 00	.....	.....	1	....	900	no	no	.....	.....	708
23,000	14,000	15 03	average	10 80	aver.	4	2	6,000	10	....	10	10	709
1,200	.....	15 00	10 00	.....	.....	....	....	.....	5	....	.....	.....	710
3,756	.....	10 00	average	.....	.....	1	....	900	1½	....	1½	.....	711
9,775	.....	9 00	.....	.....	.....	....	....	.....	50	....	.....	.....	712
1,320	275	10 00	9 00	7 00	.....	7	....	1,891	no	no	.....	.....	713
1,129	.....	9 00	.....	.....	.....	2	....	411	no	no	.....	.....	714
27,848	both	16 50	13 50	8 40	6 00	3	1	.....	yes	....	.....	.....	715

CIGAR AND TOBACCO FACTORIES.—TABLE No. 26.

26,000	both	5 20	average	for	all	3	....	4,000	.....	....	.....	.....	716
27,000	33,000	12 00	average	6 95	aver.	2	2	1,800	.....	....	.....	.....	717
20,000	4,000	10 00	average	for	all	....	1	600	no	no	.....	.....	718
7,000	400	16 00	12 00	8 00	.....	2	1	2,400	.....	....	.....	.....	719
4,600	.....	14 00	11 00	.....	.....	2	....	3,000	10	....	10	.....	720
2,050	.....	12 50	8 50	.....	.....	2	....	1,200	no	no	.....	.....	721
5,000	.....	20 00	10 00	.....	.....	2	....	1,500	10	....	10	.....	722
6,462	.....	12 00	9 60	.....	.....	3	2	5,600	no	no	.....	.....	723
89,404	.....	9 59	average	.....	.....	17	....	24,705	no	no	.....	.....	724
30,000	both	6 00	average	for	all	2	....	3,200	.....	....	.....	.....	725
2,600	.....	10 00	.....	.....	.....	....	....	.....	no	no	.....	.....	726
3,084	.....	10 07	.....	.....	.....	1	....	.....	10	....	.....	.....	727

RETURNS IN DETAIL

Breweries, Distilleries and Wine Factories;

Office No.	Capital employed, including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
728	30,000	....	.....	.....	.....	315	58	.....	.....	3	5
729	25,000	365	30,000	10	.....	500	150	2,000	2,000	6	.....
730	57,954	305	40,695	25	.....	347	227	527	17,891	10	4
731	90,000	75	13,500	5½	.....	60	260	.....	.....	2	4
732	600,000	313	125,000	9	.....	3,200	2,500	42,500	105,000	50	.....
733	100,000	312	22,500	yes	.....	1,630	600	.....	.....	10	.....
734	500,000	300	819,663	4	.....	109	3,794	.....	236,416	335	143
735	567,899	270	1,463,241	10	.....	4,578	4,963	8,104	1,224,853	115	108
736	9,500	313	22,500	33⅓	.....	170	61	.....	11,500	8	.....
737	100,000	300	118,000	15	.....	428	660	1,000	19,829	10	14
738	90,000	306	62,000	.....	3	436	866	1,500	.....	13	.....
739	14,700	312	20,000	.....	2	185	7,000	175	.....	6	.....
740	3,500	200	5,000	7	.....	40	30	.....	300	1	.....
741	25,000	305	32,000	10	.....	152	108	.....	.....	8	.....
742	71,921	295	156,934	4⅛	.....	267	698	500	.....	53	24
743	5,000	300	5,250	no	no	9	35	.....	.....	5	.....
744	45,000	312	80,000	5	.....	500	.....	500	.....	15	.....
745	10,000	365	14,500	4	.....	175	153	.....	9,800	4	.....
746	100,000	300	25,000	no	no	120	600	.....	.....	3	.....
747	32,000	313	25,200	.....	.....	330	246	.....	.....	5	.....
748	12,000	300	10,000	10	.....	125	175	500	.....	2	.....
749	58,500	311	55,600	13	.....	217	534	1,057	3,684	20	.....
750	245,000	305	205,837	10	.....	2,035	1,131	.....	101,385	33	2
751	258,564	300	207,490	15	.....	974	983	15,000	.....	27	.....
752	281,000	306	617,000	no	no	.....	3,340	.....	9,000	170	30

Chemical Works, Medicines

753	24,000	300	15,000	10	.....	202	176	.....	353	4	.....
754	10,000	100	8,000	.....	.....	128	55	.....	100	2	3
755	18,000	305	56,828	yes	.....	582	400	.....	.....	8	.....
756	25,000	300	100,000	22	.....	200	250	1,000	4,000	3	.....
757	200,000	120	16,993	.....	.....	1,728	.....	.....	.....	15	.....
758	58,560	300	71,536	10	.....	895	411	12,322	9,030	8	11
759	500,000	300	329,774	11½	.....	1,088	937	746	5,912	48	78
760	525,000	258	122,509	10	.....	789	1,374	.....	5,539	120	.....
761	75,000	300	33,000	20	.....	125	124	1,500	4,500	6	.....
762	75,000	275	39,729	yes	.....	233	759	765	.....	10	5
763	50,000	300	95,000	19	.....	200	600	600	.....	8	19
764	22,000	305	45,600	no	no	48	234	.....	.....	5	1
765	2,793,430	365	600,000	25	.....	5	99	38,720	265,709	200	.....
766	60,000	300	125,000	25	.....	600	500	.....	.....	10	25
767	5,000	200	2,900	no	no	25	.....	.....	.....	2	.....
768	15,000	305	15,000	10	.....	.....	.....	.....	.....	2	2
769	150,000	305	340,000	12	.....	.....	1,806	45,000	80,000	27	33

Oil Refineries, Paint and Varnish

770	165,000	280	268,669	4	.....	575	2,500	7,285	.....	38	20
771	95,000	310	163,500	6	.....	1,139	500	4,500	26,150	20	.....
772	23,000	305	44,500	yes	.....	446	234	.....	.....	5	2
773	9,000	300	18,500	.....	10	116	30	.....	.....	3	.....
774	15,000	306	18,000	.....	.....	130	50	.....	.....	4	1
75	142,357	304	167,459	44½	.....	846	.....	.....	.....	14	.....

FROM MANUFACTURERS.

CIGAR AND TOBACCO FACTORIES.—TABLE No. 26—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
528	120	9 00	.....	.....	3 00	.....	.....	.....	.....	.....	.....	.....	728
4,000	.....	18 00	12 00	.....	.....	1	....	2,000	5	....	5	5	729
6,240	1,000	12 24	average	4 80	.....	1	1	1,800	no	no	.....	.....	730
300	190	11 50	average	3 66	aver.	2	....	1,800	4	....	4	4	731
32,000	.....	12 31	average	.....	.....	8	1	8,100	30	....	30	.....	732
8,500	.....	16 35	average	.....	.....	2	....	.....	yes	....	.....	.....	733
186,932	30,000	14 00	7 50	14 00	6 50	13	....	34,370	10	....	10	10	734
89,419	both	8 80	average	for	all	8	2	28,719	no	no	.....	.....	735
5,628	.....	20 00	8 00	.....	.....	.....	.....	.....	no	no	.....	.....	736
6,226	2,500	12 00	9 00	3 60	aver.	4	2	5,142	10	....	10	.....	737
9,110	.....	20 00	11 00	.....	.....	3	....	4,100	no	no	.....	.....	738
5,160	.....	16 55	average	.....	.....	2	1	1,300	no	no	.....	.....	739
416	.....	.....	8 00	.....	.....	.....	.....	.....	no	no	.....	.....	740
3,125	.....	10 00	6 00	.....	.....	.....	.....	.....	10	....	10	.....	741
27,431	10,123	10 35	average	8 43	aver.	4	....	5,720	5	....	5	.....	742
2,072	.....	8 29	average	.....	.....	.....	.....	.....	no	no	.....	.....	743
9,000	.....	15 00	11 00	.....	.....	.....	.....	.....	no	no	.....	.....	744
1,714	.....	10 00	8 00	.....	.....	2	....	1,612	no	no	.....	.....	745
1,800	.....	12 00	average	.....	.....	2	....	2,000	no	no	.....	.....	746
3,283	.....	12 64	average	.....	.....	....	1	520	.....	....	.....	.....	747
1,170	.....	13 00	9 50	.....	.....	1	....	1,200	10	....	10	.....	748
10,626	.....	22 00	11 00	.....	.....	2	....	1,276	10	....	10	.....	749
17,870	496	13 50	10 80	.....	5 11	5	2	7,380	10	....	10	.....	750
17,480	.....	18 00	15 00	.....	.....	3	....	5,200	7	....	7	.....	751
114,150	both	16 00	average	5 50	aver.	7	1	9,500	no	no	.....	.....	752

AND PERFUMES.—TABLE No. 27.

1,600	.....	15 00	12 00	.....	.....	1	1	500	no	no	.....	.....	753
1,936	500	57 00	.....	10 00	.....	.....	.....	.....	.....	....	.....	.....	754
4,778	.....	11 77	average	.....	.....	1	....	1,200	no	no	.....	.....	755
1,700	.....	11 33	average	.....	.....	6	....	12,000	10	....	10	10	756
5,997	.....	30 00	average	.....	.....	2	....	1,015	.....	.....	.....	.....	757
5,160	3,009	16 00	4 80	5 46	.....	8	3	8,550	12	....	12	12	758
27,409	18,437	27 00	8 50	8 00	4 00	3	1	3,325	10	....	10	10	759
26,272	.....	13 50	10 50	.....	.....	3	1	6,146	no	no	.....	.....	760
4,000	.....	19 50	13 00	.....	.....	2	....	2,100	no	no	.....	.....	761
3,000	1,300	6 50	average	5 65	av.	3	1	3,480	yes	....	.....	.....	762
2,200	5,900	17 50	6 00	9 00	5 00	10	2	15,500	10	....	10	10	763
2,750	350	18 00	average	7 00	av.	5	2	6,000	5	....	.....	.....	764
77,088	.....	16 50	12 00	.....	.....	23	....	38,060	no	no	.....	.....	765
3,500	5,000	.....	12 00	.....	6 00	5	2	9,000	25	....	.....	.....	766
420	.....	6 36	average	.....	.....	.....	.....	.....	10	....	10	.....	767
1,250	800	15 00	10 50	12 00	4 00	1	2	900	no	no	.....	.....	768
13,000	8,700	18 00	9 00	12 00	6 00	10	10	23,000	yes	....	.....	.....	769

FACTORIES.—TABLE No. 28.

24,635	6,250	16 50	9 60	6 65	av.	4	2	7,850	.....	....	.....	.....	770
12,075	.....	27 00	12 00	.....	.....	3	2	13,150	10	....	10	10	771
3,456	462	.....	13 55	.....	4 53	5	2	5,670	5	....	.....	.....	772
1,900	.....	15 00	10 00	.....	.....	1	....	600	no	no	.....	.....	773
2,200	310	10 80	average	6 08	.....	.....	.....	.....	.....	....	.....	.....	774
10,359	.....	.....	14 88	.....	.....	3	....	5,024	no	no	.....	.....	775

RETURNS IN DETAIL

Oil Refineries, Paint and Varnish

Office No.	Capital employed, including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year.		Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees wage-earners only.	
				Increased.	Decreased.					Male.	Female.
	$		$	%	%	$	$	$	$		
776	.....	300	12,000	no	no	.....	5,000	.....	.....	3	.....
777	150,000	280	180,000	no	no	535	2,250	7,285	10,128	45	20
778	.....	307	.....	.....	.....	.....	.....	140,235	.....	463	6
779	13,000	311	20,000	25	.....	35	72	200	2,000	4	4
780	80,000	313	126,634	7½	.....	517	639	702	7,440	7	1
781	.....	365	50,000	10	.....	80	100	.....	.....	9	2

Gas Works, Electric Light,

782	170,000	365	36,420	6	.....	.....	356	6,900	.....	12	1
783	100,000	365	10,000	yes	.....	397	28	6,500	.....	7	1
784	20,000	365	5,500	yes	.....	130	86	.....	300	4	.....
785	30,000	365	7,500	no	no	157	70	260	1,033	2	.....
786	20,000	365	10,900	no	no	230	120	1,105	1,315	2	.....
787	7,783,403	365	1,990,129	13	.....	73,905	12,298	817,183	1,223,713	856	.....
788	10,000	363	4,000	.....	19½	30	181	625	590	2	.....
789	35,000	365	7,000	5	.....	90	50	500	.....	4	.....
790	57,000	365	9,000	5	.....	.....	200	2,000	1,000	3	.....
791	24,000	365	5,967	.....	10	81	.....	.....	2,500	1	.....
792	60,000	365	8,000	5	.....	175	125	2,000	400	4	.....
793	150,000	365	15,000	2	.....	348	108	9,000	.....	4	1
794	68,678	365	12,186	12½	.....	.....	46	522	3,675	4	.....
795	260,000	365	129,551	12	.....	1,411	124	.....	.....	12	.....
796	300,000	365	140,000	15	.....	1,290	803	18,000	3,900	12	2
797	20,000	365	5,183	10	.....	43	79	340	608	3	.....
798	500,000	365	216,191	9	.....	4,461	2,271	45,663	.....	115	.....
799	500,000	365	150,000	8	.....	3,882	1,200	.....	.....	44	.....
800	165,000	365	16,000	10	.....	1,489	155	15,000	2,000	8	1
801	110,000	365	16,078	1	.....	656	4,592	1,566	.....	5	.....
802	14,500	365	4,555	.....	.....	.....	25	1,133	1,492	1	.....
803	.....	365	36,000	5	.....	2,100	350	.....	.....	7	2
804	2,651,148	365	495,509	11¾	.....	14,121	2,965	112,054	.....	95	.....

Printing, Publishing and

805	100,000	305	120,000	yes	.....	250	971	.....	.....	42	8
806	224,000	300	196,039	13	.....	621	231	4,885	9,200	75	25
807	50,000	305	45,679	10	.....	339	276	500	18,275	16	.....
808	50,000	305	40,000	.....	.....	183	173	.....	5,379	16	.....
809	.....	305	110,000	yes	.....	360	550	9,500	.....	52	5
810	7,000	305	6,700	10	.....	990	56	.....	.....	5	.....
811	75,000	305	200,000	30	.....	500	1,300	3,000	30,000	125	10
812	100,000	305	70,466	13	.....	248	165	2,000	2,122	53	62
813	17,793	300	14,467	2	.....	127	124	900	800	11	2
814	200,000	305	268,821	5	.....	2,910	1,600	.....	19,000	118	38
815	115,000	305	175,000	20	.....	254	900	11,500	10,000	60	35
816	5,215	313	5,058	.....	.....	44	183	2,171	2,847	2	5
817	114,700	305	92,000	2	.....	297	520	.....	.....	50	18
818	35,000	300	25,000	1	.....	700	350	2,000	1,000	20	12
819	2,500	300	2,900	10	.....	9	43	25	50	1	2
820	15,000	310	40,000	25	.....	15	26	300	2,000	28	2

FROM MANUFACTURERS.

FACTORIES.—TABLE No. 28.—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
.....	.....	.....	.....	.....	.....	....	....	.....	no	no	.....	.....	776
25,200	5,150	13 50	9 60	6 00	.....	4	2	7,000	no	no	.....	.....	777
.....	.....	15 00	10 50	7 68	.....	33	6	.....	no	no	.....	.....	778
1,862	1,092	.....	12 00	.....	5 25	2	1	2,000	5	....	5	5	779
3,986	286	.....	10 95	.....	5 50	1	....	1,800	no	no	.....	.....	780
4,000	500	18 00	10 50	.....	5 00	1	....	1,500	.....	....	.....	.....	781

HEATING AND POWER WORKS.—TABLE No. 29.

5,157	720	15 00	12 00	14 00	.....	3	....	2,198	5	....	5	5	782
4,440	240	18 00	8 25	.....	4 62	2	1	1,920	.....	....	.....	.....	783
1,500	.....	12 00	.....	.....	.....	1	....	350	3	....	3	.....	784
778	.....	11 00	7 50	.....	.....	1	....	205	10	....	10	10	785
680	.....	14 40	9 00	.....	.....	1	....	170	no	no	.....	.....	786
588,439	.....	13 22	average	.....	.....	109	27	106,180	yes	....	.....	.....	787
970	.....	12 00	5 00	.....	.....	2	....	300	.....	yes	.....	.....	788
2,600	.....	12 50	average	.....	.....	.....	.....	.....	4	....	.....	.....	789
2,200	.....	12 00	average	.....	.....	.....	.....	.....	10	....	.....	.....	790
300	.....	.....	6 00	.....	.....	1	....	300	no	no	.....	.....	791
3,000	.....	14 42	average	.....	.....	2	....	700	no	no	.....	.....	792
2,672	416	16 50	7 50	8 00	.....	1	1	.....	1½	....	1½	1½	793
2,280	.....	30 00	9 00	.....	.....	1	....	225	no	no	.....	.....	794
7,218	.....	13 50	10 50	.....	.....	2	1	5,100	yes	....	.....	.....	795
10,000	780	18 00	10 50	9 00	4 50	5	2	4,000	5	....	5	5	796
804	.....	13 40	.....	.....	.....	1	....	125	no	no	.....	.....	797
57,943	.....	15 75	9 75	.....	.....	12	2	7,295	3	....	3	3	798
29,417	.....	15 50	11 00	.....	.....	5	2	6,980	10	....	10	.....	799
4,500	300	10 80	average	.....	6 00	....	....	.....	no	no	.....	.....	800
3,258	.....	12 50	average	.....	.....	1	....	420	5	....	5	.....	801
896	.....	17 23	.....	.....	.....	2	....	200	no	no	.....	.....	802
5,520	960	15 17	average	9 23	av.	1	2	2,760	no	no	.....	.....	803
59,937	.....	15 00	10 50	.....	.....	60	10	53,032	3	....	3	3	804

ALLIED TRADES.—TABLE No. 30.

20,022	2,522	16 75	10 75	6 18	av.	5	3	7,346	yes	....	.....	.....	805
44,454	6,500	17 00	8 00	7 00	6 00	4	9	11,128	8	....	8	.....	806
9,878	.....	16 25	6 00	.....	.....	6	2	8,696	yes	....	.....	.....	807
11,493	.....	14 08	average	.....	.....	3	2	4,200	yes	....	.....	.....	808
24,000	1,500	9 05	average	9 00	6 00	5	1	9,300	6	....	6	.....	809
2,450	.....	9 62	average	.....	.....	.....	.....	.....	10	....	.....	.....	810
75,000	6,000	11 76	average	11 76	av.	20	10	28,500	30	....	.....	.....	811
13,587	19,202	20 50	9 75	9 75	4 50	6	4	6,514	19	....	.....	.....	812
4,810	450	14 00	5 00	.....	4 50	2	....	1,502	10	....	10	.....	813
61,300	10,700	21 00	7 75	11 00	5 25	15	6	20,000	10	....	10	.....	814
30,000	11,000	16 00	8 50	7 50	5 00	10	8	15,000	10	....	.....	.....	315
1,624	859	15 00	.....	.....	3 50	1	....	1,562	no	no	.....	.....	816
34,400	6,800	16 50	9 50	5 00	5 00	22	7	29,600	6	....	6	.....	817
17,000	both	18 50	7 50	5 75	4 50	....	....	.....	.....	....	.....	.....	818
600	500	9 00	3 00	.....	5 00	....	....	.....	10	....	10	10	819
26,000	1,200	20 00	6 00	10 00	....,	4	....	4,000	20	....	.....	.....	820

RETURNS IN DETAIL

PRINTING, PUBLISHING AND

Office No.	Capital employed including plant.	No. of days in operation during 1911.	Gross value of products manufactured during year.	Production during year. Increased.	Production during year. Decreased.	Taxes paid during year.	Insurance paid during year.	Amount expended on permanent repairs or plant enlargement.	Other uncontrollable expenses.	Total No. of employees, wage-earners only. Male.	Total No. of employees, wage-earners only. Female.
	$		$	%	%	$	$	$	$		
821	4,000	312	3,800	.....	.....	20	13	.....	.....	1	3
822	20,000	305	18,000	yes	.....	160	98	725	.....	7	8
823	6,500	310	10,000	4	.....	26	49	50	100	2	1
824	35,000	300	56,000	12	.....	250	525	2,600	.....	35	10
825	44,769	305	30,460	32	.....	359	224	1,650	10,453	15	4
826	30,000	300	45,000	25	.....	1,800	400	.....	.....	30	10
827	3,900	303	4,250	2	.....	15	26	.....	.....	4	1
828	5,000	305	4,000	.....	5	80	75	.....	.....	5	1
829	87,244	303	32,715	100	.....	139	185	550	2,849	14	1
830	17,000	301	5,248	½	.....	23	64	.....	.....	6	.....

FROM MANUFACTURERS.

ALLIED TRADES—TABLE No. 30..—Continued.

Total wages paid during year to wage-earners.		Weekly wages paid.				Total No. salaried clerks and officials.		Total salaries paid to clerks, officials, etc., during year.	Wages during year have—		Class of employees affected.		Office No.
		Male.		Female.									
Male.	Female.	Skilled.	Unskilled.	Skilled.	Unskilled.	Male.	Female.		Increased.	Decreased.	Wage-earners.	Clerks, officials, etc.	
$	$	$ c.	$ c.	$ c.	$ c.			$	%	%	%	%	
300	550	.....	6 00	6 00	3 00	....	....	.....	15	....	.....	.....	821
6,500	both	16 00	11 00	6 50	3 75	1	1	1,500	11	....	11	.....	822
884	104	10 00	7 00	.....	2 00	....	....	.....	no	no	.....	.....	823
16,850	2,100	18 50	7 50	7 00	.....	....	....	.....	5	....	5	.....	824
8,169	1,400	18 50	7 50	8 00	6 50	4	....	4,000	8½	....	8½	.....	825
19,000	3,200	10 50	average	6 00	3 50	....	....	.....	5	....	.....	.....	826
1,550	375	12 00	2 50	7 50	.....	....	....	.....	.....	....	.....	.....	827
1,600	250	19 00	2 50	5 00	.....	....	1	.....	11	....	11	.....	828
11,105	312	16 86	average	6 24	.....	1	1	2,288	6	....	.....	.....	829
3,484	.....	12 50	6 25	.....	.....	1	....	364	no	no	.....	.....	830

CEMENT WORKS, ETC.—TABLE No. 31.

40,000	.....	10 50	average	.....	.....	5	....	7,000	10	....	10	.....	831
124,491	.....	14 25	9 90	.....	.....	12	1	16,490	3½	....	3½	3½	832
13,045	.....	13 50	9 00	.....	.....	2	....	4,000	10	....	10	10	833
9,000	.....	22 80	.....	.....	.....	1	....	1,000	no	no	.....	.....	834
5,084	.....	15 00	11 40	.....	.....	3	....	2,392	10	....	10	10	835
1,374	.....	12 14	average	.....	.....	.....	.....	.....	.....	....	.....	.....	836
14,007	25,634	15 00	9 00	6 00	5 10	2	1	3,882	no	no	.....	.....	837
1,305,547	.....	21 75	12 00	.....	.....	121	14	168,646	17½	....	.....	.....	838
.....	.....	.....	.....	.....	.....	1	....	1,200	no	no	.....	.....	839
91,197	.....	25 50	14 40	.....	.....	14	2	18,268	no	no	.....	.....	840
16,000	.....	30 00	18 00	.....	.....	.....	.....	.....	.....	....	.....	.....	841
20,179	.....	18 00	11 25	.....	.....	3	....	4,070	¼	....	¼	.....	842
5,000	.....	15 00	9 00	.....	.....	.....	.....	.....	5	....	5	.....	843
15,000	.....	10 00	average	.....	.....	3	....	5,000	10	....	10	.....	844
20,000	.....	18 00	12 00	.....	.....	8	3	11,000	yes	....	.....	.....	845
38,000	.....	13 20	average	.....	.....	2	1	3,000	.....	....	.....	.....	846
2,000	300	15 00	10 00	6 00	.....	....	1	300	no	no	.....	.....	847
28,009	.....	14 40	10 35	.....	.....	3	....	2,800	10	....	10	.....	848
19,876	.....	13 50	10 50	.....	.....	.....	.....	.....	3	....	3	3	849
.....	.....	.....	.....	.....	.....	2	....	1,500	.....	....	.....	.....	850
11,640	.....	18 00	12 00	.....	.....	2	2	2,490	7½	....	7½	7½	851
13,200	.....	15 75	15 30	.....	.....	2	....	2,200	12	....	12	.....	852
900	3,000	13 50	.....	.....	5 00	1	....	800	no	no	.....	.....	853
13,869	.....	12 60	average	.....	.....	1	....	1,380	no	no	.....	.....	854
9,100	.....	21 00	.....	.....	.....	.....	.....	.....	no	no	.....	.....	855
16,980	.....	18 00	12 00	.....	.....	1	....	850	16	....	16	.....	856
8,000	.....	22 50	13 20	.....	.....	1	....	1,500	no	no	.....	.....	857
5,600	.....	16 50	average	.....	.....	.....	.....	.....	no	no	.....	.....	858
9,295	.....	21 00	10 50	.....	.....	2	....	1,820	no	no	.....	.....	859
8,078	.....	10 50	average	.....	.....	.....	.....	.....	.....	....	.....	.....	860
36,000	.....	16 35	11 55	.....	.....	4	....	.....	10	....	.....	.....	861
228,855	780	20 25	13 50	.....	4 50	6	....	8,273	16	....	16	.....	862
51,142	.....	16 50	10 95	.....	.....	6	....	6,464	no	no	.....	.....	863
5,800	.....	16 50	11 40	.....	.....	3	1	5,600		....	9	9	864

MANUFACTURES.—TABLE No. 32.

16,066	.....	21 90	10 50	.....	.....	8	1	10,598	15	....	15	.....	865
5,000	4,192	16 50	9 00	.....	6 00	1	1	1,200	10	....	10	10	866
3,200	both	17 00	7 00	8 00	.....	1	1	640	6	....	6	.....	867
20,000	5,000	11 43	average	.....	3 33	4	3	.....	10	....	10	10	868

WAGES AND THEIR PROPORTION TO PRODUCT.

As 49 of the establishments included in the previous tables omit necessary details, there are only 818 given in the following tables, which show the annual and daily wages paid in the various industries and the proportion they bear to the amount of the gross product. In the average percentage of wages to product there has been an increase of 85 per cent. as compared with the previous year.

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.

LUMBER MANUFACTURERS.—TABLE NO. 1.

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
1	620	170	315,000	1,000,000	508 06	2 99	32	68	1
2	253	152	89,732	403,059	590 03	3 88	22	78	2
3	145	160	28,983	275,000	199 88	1 25	11	89	3
4	42	180	12,000	100,000	285 71	1 59	12	88	4
5	70	300	20,710	40,000	295 86	99	52	48	5
6	102	190	36,560	225,000	358 43	1 88	16	84	6
7	36	180	15,376	59,586	420 71	2 33	26	74	7
8	71	250	28,100	150,000	395 77	1 58	19	81	8
9	122	139	52,087	251,817	426 85	3 07	21	79	9
10	70	150	21,700	175,000	310 00	2 07	12	88	10
11	55	300	33,340	112,439	606 18	2 02	30	70	11
12	8	300	4,000	8,000	500 00	1 67	50	50	12
13	20	260	5,500	20,000	275 00	1 06	28	72	13
14	12	300	5,000	100,000	416 67	1 39	5	95	14
16	49	50	5,780	25,000	117 96	2 36	23	77	16
17	260	220	64,000	350,000	246 15	1 12	18	82	17
18	116	130	24,000	172,000	206 90	1 59	14	86	18
19	82	305	33,899	411,712	413 40	1 36	8	92	19
20	12	300	8,840	26,500	733 33	2 44	30	70	20
21	92	151	31,537	131,000	342 79	2 27	24	76	21
22	48	296	38,495	62,461	801 98	2 71	62	38	22
23	7	200	1,500	4,000	214 29	1 07	38	62	23
24	433	160	264,840	1,000,000	611 64	3 82	26	74	24
25	21	300	3,176	16,000	151 24	50	20	80	25
27	26	300	15,300	95,000	588 46	1 96	16	84	27
28	4	100	600	1,500	150 00	1 50	40	60	28
29	17	150	4,500	20,000	264 71	1 76	23	77	29
30	21	150	11,000	30,000	523 81	3 49	37	63	30
31	12	130	3,000	11,000	250 00	1 92	27	73	31
32	45	300	18,000	30,000	400 00	1 33	60	40	32
33	255	312	156,000	250,000	611 76	1 96	62	38	33
34	21	100	5,194	18,750	247 33	2 47	28	72	34
35	162	175	56,400	345,000	348 15	1 99	16	84	35
36	8	150	3,000	4,500	375 00	2 50	67	33	36
37	173	264	109,764	673,721	634 47	2 40	12	88	37
38	3	100	300	1,000	100 00	1 00	30	70	38
39	117	150	52,000	200,000	444 44	1 96	26	74	39
40	106	300	53,500	225,000	504 72	1 68	24	76	40
42	67	300	34,625	143,180	516 64	1 72	24	76	42
44	4	140	1,015	4,528	253 75	1 81	22	78	44
45	25	180	4,000	20,000	160 00	89	20	80	45
47	300	160	95,000	550,000	316 67	1 98	17	83	47
49	20	140	4,000	50,000	200 00	1 43	8	92	49

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

LUMBER MANUFACTURERS.—TABLE No. 1.—*Continued.*

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
50	5	300	1,700	20,500	340 00	1 13	8	92	50
51	43	300	27,400	200,000	637 22	2 12	14	86	51
53	21	260	7,200	40,000	342 86	1 32	18	82	53
54	10	124	2,000	8,469	200 00	1 60	24	76	54
55	165	300	51,000	120,000	309 09	1 03	43	57	55
56	302	312	30,800	60,000	101 99	33	51	49	56
57	8	245	3,550	6,829	443 75	1 82	52	48	57
58	49	130	13,493	65,000	275 16	2 12	21	79	58
59	305	300	130,336	514,000	427 33	1 42	25	75	59
60	22	90	6,400	25,000	290 91	3 23	26	74	60
61	8	30	346	1,000	43 25	1 44	35	65	61
62	16	300	6,700	10,000	418 75	1 40	67	33	62
63	12	100	1,680	11,560	140 00	1 40	15	85	63
65	6	200	1,800	7,500	300 00	1 50	24	76	65
66	4	200	1,300	15,000	325 00	1 63	9	91	66
67	7	258	1,436	4,750	205 14	80	30	70	67
68	15	116	2,500	18,000	166 67	1 44	14	86	68
69	7	275	2,400	15,000	342 86	1 25	16	84	69
	5,137	average 206	2,063,394	8,934,301	average 354 57	average 1 79	average 27	average 73	

PLANING MILLS, SASH AND DOOR FACTORIES, ETC.—TABLE No. 2.

70	109	313	42,000	150,000	385 32	1 25	28	72	70
71	48	300	17,864	48,000	372 17	1 24	37	63	71
72	83	300	36,650	125,000	441 57	1 47	29	71	72
73	28	250	12,000	50,000	428 57	1 71	24	76	73
74	28	300	10,500	20,000	375 00	1 25	52	48	74
75	4	250	2,000	10,000	500 00	2 00	20	80	75
76	60	300	38,495	344,055	573 43	1 91	10	90	76
77	58	300	45,747	80,000	788 74	2 63	59	41	77
78	173	300	92,500	310,000	534 68	1 78	30	70	78
79	48	250	25,900	46,000	539 58	2 16	56	44	79
80	69	300	32,360	210,000	468 12	1 56	15	85	80
81	8	104	936	3,935	117 00	1 13	24	76	81
82	5	280	2,100	8,000	420 00	1 50	26	74	82
84	47	300	33,000	200,000	750 00	2 50	17	83	84
85	67	270	24,200	140,000	373 88	1 38	17	83	85
86	9	38	900	1,700	100 00	1 11	53	47	86
87	53	300	28,500	115,000	537 74	1 79	25	75	87
89	37	312	27,786	60,000	750 97	2 41	46	54	89
90	15	270	8,413	30,226	560 89	2 07	18	82	90
91	6	250	3,640	30,000	606 67	2 43	12	88	91
92	68	290	24,278	125,000	357 03	1 23	20	80	92
93	16	100	2,000	5,000	125 00	1 25	40	60	93
94	72	300	43,878	56,000	609 42	2 03	78	22	94
95	13	290	6,965	44,000	535 81	1 88	16	84	95
96	15	310	7,435	25,000	499 00	1 61	30	70	96
97	11	300	5,375	45,000	488 64	1 83	12	88	97
98	37	305	44,900	103,400	1,213 51	3 98	43	57	98
99	54	300	29,000	100,000	537 04	1 79	29	71	99

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

PLANING MILLS, SASH AND DOOR FACTORIES, ETC.—TABLE NO. 2.—*Continued.*

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
100	16	305	8,736	94,800	546 00	1 79	9	91	100
101	10	240	3,600	10,863	360 00	1 50	33	67	101
102	34	310	13,220	42,000	388 82	1 25	32	68	102
103	65	305	23,770	100,000	365 69	1 20	24	76	103
104	60	300	23,570	100,000	392 83	1 31	24	76	104
		Average			Average	Average	Average	Average	
	1,423	271	722,208	2,852,979	486 16	1 75	30	70	

WOODWORKING FACTORIES, SPECIALTIES IN WOODENWARE.—TABLE NO. 3.

105	37	300	17,193	72,000	464 68	1 55	24	76	105
106	45	300	19,000	120,000	422 22	1 41	16	84	106
107	39	48	8,453	41,958	216 74	4 52	20	80	107
108	88	290	31,200	150,000	354 55	1 22	21	79	108
109	7	305	3,106	6,690	443 71	1 45	46	54	109
110	222	300	73,352	312,472	343 93	1 48	23	77	110
111	17	200	9,860	28,637	580 00	2 90	34	66	111
112	33	301	22,510	60,567	682 12	2 26	37	63	112
113	43	290	15,880	33,638	369 30	1 28	47	53	113
114	12	300	8,900	20,000	741 67	2 47	45	55	114
115	44	300	22,500	108,000	511 36	1 70	21	79	115
116	6	275	4,500	15,000	750 00	2 76	30	70	116
117	8	307	5,671	10,800	708 88	2 39	53	47	117
118	197	294	72,550	190,000	368 27	1 25	38	62	118
119	7	280	3,100	15,000	442 86	1 58	21	79	119
120	51	300	18,520	50,000	363 14	1 21	37	63	120
121	40	305	11,000	20,709	275 00	90	53	47	121
123	34	300	12,200	65,000	358 82	1 20	19	81	123
124	16	200	3,000	7,000	187 50	94	43	57	124
125	5	290	1,992	7,500	398 40	1 37	27	73	125
126	37	225	10,800	40,000	291 90	1 30	27	73	126
127	143	300	27,500	95,000	102 31	64	28	72	127
128	130	295	43,900	135,000	337 69	1 14	33	67	128
129	25	279	11,800	72,000	472 00	1 69	16	84	129
130	5	300	3,000	5,000	600 00	2 00	60	40	130
131	18	300	7,000	18,000	388 89	1 30	39	61	131
132	49	300	21,569	85,000	440 20	1 47	25	75	132
133	85	300	37,978	90,000	446 80	1 49	42	58	133
134	43	300	19,400	100,000	451 16	1 50	19	81	134
135	31	250	10,900	14,000	358 06	1 43	78	22	135
137	2	313	1,200	3,000	600 00	1 92	40	60	137
138	3	300	1,400	2,500	466 67	1 56	56	44	138
139	11	304	4,825	8,057	438 64	1 44	60	40	139
140	10	300	2,500	6,000	250 00	83	42	58	140
141	58	300	39,592	70,000	682 62	2 28	56	44	141
142	26	310	9,500	25,000	365 38	1 79	38	62	142
143	95	300	31,000	110,000	326 32	1 09	28	72	143
144	14	300	12,400	32,000	885 71	2 95	39	61	144
145	17	313	6,400	15,000	376 47	1 20	43	57	145
147	117	300	47,262	105,023	403 95	1 35	45	55	147
148	28	225	15,000	50,000	535 71	2 38	30	70	148
		Average			Average	Average	Average	Average	
	1,898	282	729,413	2,412,551	446 19	1 70	37	63	

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

FURNITURE MANUFACTURERS; BANK AND OFFICE FITTINGS.—TABLE No. 4.

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
149	84	300	45,000	100,000	535 71	1 79	45	55	149
150	128	300	97,400	200,000	760 94	2 54	49	51	150
151	62	285	28,900	88,000	466 13	1 64	33	67	151
152	74	300	30,000	119,000	405 41	1 35	25	75	152
153	142	300	70,693	218,022	497 84	1 66	32	68	153
154	33	295	15,362	35,000	465 45	1 57	44	56	154
155	51	300	21,700	68,000	425 49	1 42	32	68	155
156	75	300	30,728	145,000	409 71	1 37	21	79	156
157	82	300	37,000	110,000	451 22	1 50	34	66	157
158	55	305	23,650	100,000	430 00	1 41	24	76	158
159	122	300	81,800	300,000	670 49	2 23	27	73	159
160	44	307	16,111	31,592	366 16	1 19	51	49	160
161	69	300	32,000	100,000	463 77	1 55	32	68	161
162	38	300	18,914	62,807	497 74	1 66	30	70	162
163	34	305	15,000	46,000	441 18	1 45	33	67	163
164	320	290	167,250	460,000	522 66	1 80	36	64	164
165	85	300	56,014	775,000	658 99	2 17	7	93	165
166	31	300	14,500	31,000	467 74	1 56	47	53	166
167	470	306	226,606	720,000	482 13	1 38	31	69	167
168	80	306	47,261	129,955	590 76	1 93	37	63	168
169	39	300	31,298	75,000	802 51	2 68	42	58	169
170	70	300	25,811	81,821	368 73	1 23	32	68	170
171	166	296	78,290	227,929	471 63	1 59	34	66	171
172	48	301	19,757	62,761	411 60	1 37	31	69	172
173	50	300	22,460	70,000	449 20	1 47	32	68	173
174	70	300	28,500	100,000	407 14	1 36	29	71	174
175	76	300	34,100	120,000	448 68	1 50	28	72	175
176	72	300	32,200	110,000	447 52	1 49	29	71	176
177	49	300	41,000	100,000	837 73	2 79	41	59	177
178	93	245	35,630	91,156	383 12	1 56	39	61	178
179	328	300	169,500	324,000	516 77	1 72	51	49	179
180	49	300	26,600	60,000	542 86	1 81	44	56	180
181	28	305	12,500	40,000	446 43	1 46	31	69	181
182	317	283	138,309	370,974	436 31	1 54	37	63	182
183	57	305	26,300	75,000	461 40	1 51	35	65	183
184	12	305	8,200	33,000	683 33	2 24	25	75	184
185	48	300	22,700	52,464	472 92	1 58	43	57	185
186	51	300	35,000	121,000	686 27	2 29	29	71	186
187	92	300	38,500	185,000	418 78	1 40	21	79	187
188	156	293	83,896	264,347	537 80	1 84	32	68	188
189	31	300	23,800	50,000	767 74	2 56	48	52	189
190	50	300	26,560	59,500	531 20	1 77	45	55	190
191	17	305	3,700	18,000	217 65	71	21	79	191
	4,048	Average 299	2,040,500	6,531,328	Average 505 97	Average 1 69	Average 34	Average 66	

CARRIAGES, VEHICLES AND PARTS THEREOF, MOTORS, ETC—TABLE No. 5.

192	32	280	13,500	50,000	421 88	1 51	27	73	192
193	229	300	137,400	325,000	600 00	2 00	42	58	193
194	26	300	23,570	42,500	906 54	3 02	55	45	194
195	53	308	38,153	162,318	719 87	2 34	24	76	195
196	19	300	7,400	35,000	389 47	1 30	21	79	196
197	73	300	27,350	183,865	374 66	1 25	15	85	197
198	66	300	36,500	150,000	553 03	1 84	24	76	198
199	20	250	10,200	50,000	510 00	2 04	20	80	199
200	155	290	84,869	298,735	547 10	1 89	22	78	200

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

CARRIAGES, VEHICLES AND PARTS THEREOF; MOTORS, ETC.—TABLE No. 5.—*Continued.*

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
201	85	313	79,684	188,614	936 46	3 00	42	58	201
202	221	310	135,700	534,000	614 03	1 98	25	75	202
203	31	300	23,250	56,000	750 00	2 50	42	58	203
204	50	300	30,700	100,000	614 00	2 05	31	69	204
205	8	310	8,000	35,000	1,000 00	3 23	23	77	205
206	17	300	10,103	48,071	594 29	1 98	21	79	206
207	147	313	64,364	270,000	437 85	1 40	24	76	207
208	346	300	188,600	822,000	545 09	1 82	23	77	208
209	15	305	15,880	30,000	1,058 67	3 47	53	47	209
210	14	300	8,718	23,141	622 71	2 08	38	62	210
211	11	305	5,950	22,150	540 91	1 77	27	73	211
212	3	312	1,872	7,000	624 00	2 00	27	73	312
213	381	308	200,119	600,000	525 25	1 71	33	67	213
214	75	300	28,512	80,000	380 16	1 27	36	64	214
215	375	300	130,744	2,420,788	348 6[illegible]	1 16	5	95	215
216	12	300	6,000	24,000	500 00	1 67	25	75	216
217	28	300	21,540	40,000	769 32	2 56	54	46	217
218	5	300	2,500	12,000	500 00	1 67	21	79	218
		Average			Average	Average	Average	Average	
	2,497	300	1,341,118	6,610,182	606 81	2 02	30	70	

AGRICULTURAL IMPLEMENTS, DAIRY MACHINERY, ETC.—TABLE No. 6.

219	104	298	29,880	100,000	287 38	96	30	70	219
220	25	307	14,465	93,514	578 60	1 88	15	85	220
221	358	300	249,323	1,000,000	712 35	2 38	25	75	221
222	32	300	13,919	35,000	434 97	1 45	40	60	222
223	5	225	2,600	7,000	520 00	2 31	37	63	223
224	86	305	46,147	224,048	536 59	1 76	21	79	224
225	58	280	32,000	200,000	551 72	1 97	16	84	225
226	85	300	26,300	250,000	309 41	1 03	11	89	226
227	6	305	3,500	15,000	583 33	1 97	23	77	227
228	10	305	2,500	12,000	250 00	82	21	79	228
229	24	305	10,100	30,000	420 83	1 38	34	66	229
230	51	280	24,800	200,000	486 27	1 74	12	88	230
231	4	200	2,430	12,000	607 50	2 03	20	80	231
232	41	300	26,766	80,000	628 44	2 09	33	67	232
233	77	300	49,159	175,000	638 95	2 13	27	73	233
234	15	305	6,675	32,200	445 00	1 13	21	79	234
		Average			Average	Average	Average	Average	
	981	288	540,564	2,465,762	497 21	1 69	24	76	

PIANO, ORGAN AND MUSICAL INSTRUMENT FACTORIES.—TABLE No. 7.

235	67	300	26,560	100,000	396 42	1 32	27	73	235
236	115	300	61,595	234,070	535 61	1 79	26	74	236
237	32	300	20,500	60,000	640 63	2 14	34	66	237
238	2	295	835	4,000	417 50	1 42	21	79	238
239	28	300	17,751	61,737	634 00	2 11	29	71	239
		Average			Average	Average	Average	Average	
	244	299	127,241	459,807	524 83	1 76	27	73	

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

WOOD-PULP, PAPER AND STATIONERY.—TABLE No. 8.

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
240	210	262	93,810	527,467	446 71	1 70	18	82	240
241	30	303	9,200	80,000	306 67	1 01	12	88	241
242	52	305	17,444	44,500	335 46	1 10	39	61	242
243	10	310	5,353	17,500	535 30	1 25	30	70	243
244	29	301	19,812	114,818	621 10	2 06	18	82	244
245	24	305	7,325	11,500	305 21	1 00	64	36	245
246	47	305	18,750	60,000	398 94	1 31	31	69	246
247	22	286	9,144	30,000	415 64	1 45	30	70	247
248	28	300	18,000	65,000	642 86	2 14	28	72	248
249	153	300	46,100	156,000	301 31	1 00	30	70	249
250	10	300	2,400	10,000	240 00	80	24	76	250
251	16	300	8,500	60,000	531 25	1 77	14	86	251
252	15	305	7,400	38,875	361 00	1 18	19	81	252
253	63	310	29,264	216,000	464 51	1 18	14	86	253
254	22	305	7,400	30,000	335 45	1 10	27	73	254
255	44	305	25,000	95,000	568 11	1 86	26	74	255
256	12	300	8,500	30,000	708 33	2 36	28	72	256
257	35	312	18,000	50,000	514 28	1 65	36	64	257
	822	Average 301	351,402	1,636,660	Average 446 23	Average 1 44	Average 27	Average 73	

FOUNDRIES, ROLLING MILLS, STRUCTURAL IRON.—TABLE No. 9.

258	124	365	86,061	394,688	694 04	1 92	22	78	258
259	50	291	25,500	59,500	510 00	1 75	43	57	259
260	28	300	17,566	40,000	627 36	2 09	44	56	260
261	140	285	95,376	486,577	680 26	2 39	20	80	261
262	182	298	99,371	438,574	545 99	1 83	23	77	262
263	324	303	199,540	822,202	615 86	2 03	24	76	263
264	8	305	4,000	10,000	500 00	1 64	40	60	264
265	155	280	97,547	200,000	629 34	2 25	49	51	265
268	840	275	560,000	1,400,000	666 67	2 06	40	60	268
269	73	276	45,772	123,000	627 01	2 27	37	63	269
270	30	300	18,937	137,213	631 23	2 10	14	86	270
271	110	300	69,676	167,630	633 42	2 11	42	58	271
272	45	300	20,189	70,000	448 64	1 50	29	71	272
273	45	262	27,963	60,310	621 40	2 37	46	54	273
274	12	300	6,852	11,000	571 00	1 90	62	38	274
275	8	275	3,000	10,000	375 00	1 36	30	70	275
276	142	300	81,185	213,000	571 73	1 91	38	62	276
277	7	305	3,500	17,000	500 00	1 64	21	79	277
278	43	300	17,650	60,000	410 47	1 37	29	71	278
279	51	305	39,914	100,000	782 63	2 56	40	60	279
280	33	300	27,000	50,000	818 18	2 73	54	46	280
281	31	300	16,817	80,000	542 26	1 61	21	79	281
282	56	300	43,000	150,000	767 86	2 56	29	71	282
283	21	280	19,500	49,600	928 57	3 33	33	67	283
284	67	280	31,000	90,000	462 87	1 65	34	66	284
285	4	300	2,200	6,000	550 00	1 83	37	63	285
286	7	300	4,000	8,000	571 43	1 90	50	50	286
287	154	225	93,700	296,500	608 44	2 70	33	67	287
288	27	300	12,000	25,000	444 44	1 48	48	52	288
	2,817	Average 293	1,768,816	5,575,794	Average 597 45	Average 2 08	Average 36	Average 64	

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

STOVES, HOT AIR FURNACES, ETC.—TABLE No. 10.

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
289	85	313	66,442	185,000	781 67	2 51	36	64	289
290	24	300	17,049	38,522	710 38	2 37	44	56	290
291	8	330	4,808	8,000	600 00	1 82	60	40	291
292	128	290	73,700	162,000	575 78	1 99	45	55	292
293	48	300	24,400	50,000	508 33	1 69	49	51	293
294	175	290	130,400	275,000	745 14	2 57	47	53	294
295	325	265	184,200	500,000	566 77	2 14	37	63	295
296	29	280	19,938	52,000	687 24	2 45	38	62	296
297	7	315	3,558	11,600	508 29	1 61	31	69	297
298	17	300	4,200	8,000	247 06	82	52	48	298
299	115	305	64,146	140,000	557 08	1 82	46	54	299
300	41	305	30,300	85,000	739 02	2 42	36	64	300
301	9	305	4,345	13,500	482 78	1 58	34	66	301
302	164	300	65,000	200,000	396 34	1 32	32	68	302
303	8	300	4,065	10,000	508,13	1 69	41	59	303
304	16	300	8,500	25,000	531 25	1 77	34	66	304
305	94	297	53,723	133,567	571 52	1 92	40	60	305
	1,293	Average 300	758,774	1,897,189	Average 571 58	Average 1 91	Average 41	Average 59	

ENGINE, BOILER AND MACHINERY FACTORIES.—TABLE No. 11.

307	35	300	20,500	40,000	585 71	1 95	51	49	307
308	104	300	41,161	96,265	395 78	1 32	43	57	308
309	64	300	38,240	120,000	597 50	1 99	32	68	309
310	46	300	20,416	53,000	443 83	1 45	40	60	310
311	13	304	14,025	20,000	1,078 85	3 54	70	30	311
312	17	305	11,400	58,000	670 59	2 20	20	80	312
313	16	305	9,000	21,000	562 50	1 84	43	57	313
314	12	300	6,140	19,000	511 67	1 71	32	68	314
315	9	300	4,200	10,000	466 67	1 56	42	58	315
316	109	306	66,000	350,000	605 50	1 98	19	81	316
318	51	300	29,807	65,000	584 45	1 95	46	54	318
319	12	300	10,000	65,000	833 33	2 78	15	85	319
320	10	300	7,000	30,000	700 00	2 33	23	77	320
321	4	300	3,638	7,695	909 50	3 03	47	53	321
322	23	305	14,000	44,434	608 70	2 00	32	68	322
323	251	300	169,950	600,000	677 09	2 26	28	72	323
324	19	300	10,080	25,850	530 53	1 77	39	61	324
325	38	308	18,445	40,008	485 40	1 58	46	54	325
326	12	300	5,000	10,000	416 67	1 39	50	50	326
327	17	305	11,231	63,048	660 65	2 17	18	82	327
329	150	300	80,000	320,000	533 33	1 78	25	75	329
331	8	305	7,500	50,000	937 50	3 07	15	85	331
332	12	300	6,140	19,000	511 67	1 72	32	68	332
334	98	300	65,000	190,000	663 28	2 21	34	66	334
335	42	300	17,050	72,000	405 95	1 35	24	76	335
336	128	300	65,010	160,000	507 89	1 69	41	59	336
337	19	305	9,185	19,644	483 42	1 58	47	53	337
339	36	300	27,500	60,000	763 89	2 55	46	54	339
341	136	305	96,000	275,000	705 88	2 31	35	65	341
342	16	303	6,475	20,287	404 69	1 34	32	68	342
344	29	354	28,800	63,240	993 10	2 81	45	55	344
345	16	300	6,350	60,000	396 88	1 34	11	89	345

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

ENGINE, BOILER AND MACHINERY FACTORIES.—TABLE No. 11.—*Continued.*

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
346	17	300	9,457	25,600	555 88	1 85	37	63	346
347	39	308	20,069	42,258	514 59	1 67	47	53	347
348	23	300	15,400	59,000	669 57	2 23	26	74	348
349	38	300	14,200	93,000	373 68	1 25	15	85	349
350	21	305	12,127	58,192	577 48	1 89	21	79	350
351	15	275	5,000	15,000	333 33	1 21	33	67	351
352	10	300	7,650	20,000	765 00	2 55	38	62	352
353	57	345	31,200	86,000	547 37	1 59	36	64	353
354	11	300	8,300	12,000	754 55	2 52	69	31	354
355	427	280	247,265	650,000	579 05	2 07	38	62	355
356	27	300	13,122	45,375	486 00	1 62	29	71	356
357	144	305	92,000	135,000	638 89	2 09	68	32	357
358	6	305	5,600	10,000	933 33	3 06	56	44	358
359	9	305	5,793	40,000	643 67	2 11	15	85	359
360	7	313	4,798	16,388	685 43	2 19	29	71	360
361	42	305	28,000	75,000	666 67	2 19	37	63	361
362	4	300	1,808	12,839	452 00	1 51	16	84	362
363	380	305	264,000	600,000	694 74	2 28	44	56	363
364	31	308	13,948	48,417	449 94	1 46	29	71	364
365	11	305	5,520	30,000	501 82	1 65	18	82	365
367	24	286	12,800	25,000	533 33	1 82	51	49	367
368	4	300	1,800	10,000	450 00	1 50	18	82	368
369	16	310	8,500	15,000	531 25	1 71	57	43	369
370	76	300	40,000	125,000	526 32	1 79	32	68	370
371	91	300	50,909	157,400	559 44	1 86	32	68	371
372	23	305	12,439	36,500	540 83	1 77	34	66	372
373	24	300	9,500	25,000	395 83	1 32	38	62	373
374	186	350	125,750	297,500	676 08	2 25	42	58	374
	3,315	Average 301	1,992,198	5,812,940	Average 594 47	Average 1 96	Average 35	Average 65	

METALLIC ROOFING AND LIGHT IRONWARE.—TABLE No. 12.

375	7	313	5,194	18,629	742 00	2 37	28	72	375
376	10	310	6,003	28,347	600 30	1 94	21	79	376
377	70	300	30,000	130,000	428 57	1 43	23	77	377
378	48	300	38,300	125,000	693 75	2 31	27	73	378
379	191	300	95,000	350,000	497 38	1 66	27	73	379
381	23	300	11,700	36,000	508 70	1 70	33	67	381
382	26	304	14,636	60,000	562 92	1 85	24	76	382
383	286	304	178,456	450,000	623 97	2 05	40	60	383
384	20	300	9,900	35,000	495 00	1 65	28	72	384
385	16	309	11,902	28,462	743 88	2 41	42	58	385
386	125	300	66,800	325,000	534 40	1 78	21	79	386
387	315	300	191,543	640,700	608 00	2 03	21	79	387
388	73	302	29,902	88,684	409 62	1 36	34	66	388
389	39	305	24,760	65,000	634 87	2 05	33	67	389
390	8	300	3,300	15,000	412 50	1 38	22	78	390
391	37	305	18,332	110,000	495 41	1 62	17	83	391
392	11	305	4,300	28,000	390 90	1 28	15	85	392
393	78	300	35,878	87,162	459 97	1 53	41	59	393
394	9	185	3,914	7,897	434 89	2 35	50	50	394
395	39	300	17,475	40,000	448 08	1 49	44	56	395

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

METALLIC ROOFING AND LIGHT IRONWARE.—TABLE No. 12—*Continued.*

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c	%	%	
396	27	300	17,065	50,000	632 04	2 11	34	66	396
397	57	300	33,559	120,000	588 75	1 96	28	72	397
398	5	300	2,500	5,200	500 00	1 67	48	52	398
399	154	300	54,500	125,000	353 90	1 18	44	56	399
400	52	305	22,000	50,000	423 08	1 39	44	56	400
401	38	300	25,425	92,156	669 08	2 23	28	72	401
402	579	304	321,780	833,676	555 75	1 83	39	61	402
		Average			Average	Average	Average	Average	
	2,343	298	1,269,124	3,944,913	535 10	1 80	32	68	

WIRE FENCE, WIRE ROPE AND WIRE CLOTH FACTORIES.—TABLE No. 13.

403	22	300	10,645	171,346	483 96	1 61	6	94	403
404	10	300	5,000	23,000	500 00	1 67	22	78	404
405	38	200	24,000	250,000	631 58	3 16	10	90	405
406	12	350	4,850	7,000	404 17	1 15	69	31	406
407	41	310	12,600	50,000	307 32	99	25	75	407
408	15	300	6,100	75,000	406 67	1 36	8	92	408
409	124	290	117,000	450,000	943 55	3 25	26	74	409
410	10	200	4,847	30,168	484 70	2 83	16	84	410
411	15	300	6,800	12,000	453 33	1 51	57	43	411
412	14	250	8,916	80,000	636 86	2 55	11	89	412
413	77	300	47,000	150,000	610 39	2 03	31	69	413
414	7	300	4,300	10,000	614 29	2 05	43	57	414
415	272	276	142,839	677,369	524 78	1 90	21	79	415
		Average			Average	Average	Average	Average	
	657	283	394,897	1,985,883	528 58	2 00	27	73	

BRASSWARE AND PLUMBERS' SUPPLIES.—TABLE No. 14.

416	9	304	10,915	93,005	1,212 77	3 99	12	88	416
417	187	225	84,082	300,000	449 64	2 00	28	72	417
418	30	305	17,317	35,390	577 23	1 89	49	51	418
419	37	300	23,500	65,000	635 14	2 12	36	64	419
420	31	305	22,075	40,160	712 10	2 33	50	50	420
421	6	270	5,600	12,000	933 33	3 46	47	53	421
422	166	300	98,524	242,725	593 52	1 98	41	59	422
424	33	250	17,604	103,600	533 45	2 13	17	83	424
425	35	300	16,050	35,000	458 57	1 53	46	54	425
426	69	300	30,892	114,917	447 71	1 49	27	73	426
427	192	300	85,000	400,000	442 17	1 48	21	79	427
428	17	305	10,718	75,000	630 00	2 07	14	86	428
429	40	305	17,500	50,000	437 50	1 43	35	65	429
430	69	300	32,000	90,000	463 77	1 55	36	64	430
431	73	300	35,500	250,000	486 30	1 62	14	86	431
		Average			Average	Average	Average	Average	
	994	291	507,277	1,906,797	600 88	2 07	32	68	

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

SILVER-PLATED WARE AND JEWELLERY FACTORIES.—TABLE No. 15.

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
432	134	274	107,421	386,925	801 65	2 93	28	72	432
433	15	304	6,990	25,000	466 00	1 53	28	72	433
434	125	300	82,779	193,200	662 23	2 21	43	57	434
435	4	200	1,800	4,500	450 00	2 25	40	60	435
436	30	300	12,300	47,500	410 00	1 37	25	75	436
437	12	304	4,929	9,575	410 75	1 35	51	49	437
438	110	295	72,642	250,800	660 38	2 24	29	71	438
	430	average 282	288,861	917,500	average 551 57	average 1 98	average 35	average 65	

WOOLLEN, COTTON AND YARN MILLS.—TABLE No. 16.

439	310	288	120,700	620,000	389 35	1 35	19	81	439
440	1,030	298	381,000	1,790,000	369 90	1 24	21	79	440
441	49	300	15,500	80,000	316 33	1 05	19	81	441
442	158	278	63,712	357,199	423 24	1 45	18	82	442
443	50	200	7,000	8,000	140 00	70	87	13	443
444	2	200	752	1,500	376 00	1 88	50	50	444
445	43	200	6,000	10,000	139 53	70	60	40	445
446	9	305	4,717	23,000	524 11	1 72	21	79	446
447	55	240	7,600	10,700	138 18	58	71	29	447
448	5	300	2,000	10,000	400 00	1 33	20	80	448
449	99	305	36,312	85,000	366 79	1 21	43	57	449
450	21	250	6,600	8,300	314 29	1 26	78	22	450
451	8	300	2,700	20,000	339 50	1 13	14	86	451
452	2	200	1,550	18,000	775 00	3 87	9	91	452
453	137	250	32,000	400,000	233 58	93	8	92	453
454	13	300	4,600	15,000	353 85	1 18	31	69	454
455	20	300	8,000	80,000	400 00	1 33	10	90	455
456	14	224	3,590	18,000	256 43	1 14	20	80	456
457	31	200	6,760	9,000	218 06	1 09	75	25	457
458	114	300	45,000	212,000	394 74	1 32	21	79	458
459	42	300	15,000	75,000	357 14	1 19	20	80	459
460	103	300	34,000	125,000	330 10	1 10	27	73	460
461	8	234	2,922	10,158	365 25	1 56	29	71	461
462	3	150	750	3,000	250 00	1 67	25	75	462
464	19	275	9,996	91,178	526 05	1 91	11	89	464
465	4	200	750	1,500	187 50	99	50	50	465
466	4	300	1,200	5,000	300 00	1 00	24	76	466
468	14	300	5,400	60,000	385 71	1 29	9	91	468
469	38	300	17,500	70,000	460 53	1 54	21	79	469
470	9	301	6,000	90,000	666 67	2 21	7	93	470
471	8	300	2,500	8,000	312 50	1 04	31	69	471
472	36	300	13,000	55,000	361 11	1 20	24	76	472
473	125	300	39,050	150,000	312 40	1 04	26	74	473
474	19	300	6,100	15,000	321 05	1 07	41	59	474
	2,602	average 268	910,261	4,534,535	average 353 09	a verage 1 33	average 31	average 69	

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

KNITTED GOODS FACTORIES.—TABLE No. 17.

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
475	147	280	50,600	260,000	344 21	1 23	19	81	475
476	125	300	38,500	150,000	308 00	1 03	26	74	476
477	25	305	13,500	80,000	540 00	1 77	17	83	477
478	142	245	40,060	151,000	282 11	1 15	27	73	478
479	3	305	624	11,000	208 00	68	6	94	479
480	142	280	51,500	240,000	362 68	1 30	21	79	480
481	60	300	21,700	110,000	361 67	1 21	20	80	481
482	24	300	7,628	47,000	317 83	1 06	16	84	482
483	2,307	308	809,747	3,527,122	351 00	1 14	23	77	483
484	114	298	34,540	155,843	303 00	1 02	22	78	484
485	57	305	16,158	66,000	283 48	93	24	76	485
486	66	303	22,600	72,000	342 42	1 12	31	69	486
487	35	300	11,467	80,550	327 63	1 09	14	86	487
488	5	200	1,150	6,000	230 00	1 15	19	81	488
489	287	305	100,280	589,142	349 41	1 15	17	83	489
490	104	280	29,440	260,000	283 08	1 01	11	89	490
491	50	300	14,000	75,000	280 00	93	19	81	491
492	34	300	7,560	30,000	222 35	74	25	75	492
493	58	278	23,907	176,500	412 19	1 47	14	86	493
494	42	300	14,550	66,000	346 40	1 15	22	78	494
	3,827	average 290	1,309,511	6,153,157	average 322 77	average 1 12	average 20	average 80	

CLOTHING FACTORIES, MILLINERY, ETC.—TABLE No. 18.

496	129	300	60,000	200,000	465 12	1 55	30	70	496
497	97	270	51,087	65,300	526 67	1 95	78	22	497
498	105	295	41,958	225,000	304 36	1 03	14	86	498
499	89	300	39,000	200,000	438 20	1 46	20	80	499
500	58	278	23,907	176,500	412 19	1 48	14	86	500
501	88	300	27,500	205,000	312 50	1 04	13	87	501
502	81	280	38,000	200,000	469 14	1 67	19	81	502
503	36	225	18,250	70,000	506 94	2 25	26	74	503
504	222	302	78,325	215,000	352 82	1 17	36	64	504
505	85	305	35,341	80,000	415 78	1 33	44	56	505
506	85	295	38,839	125,000	456 93	1 55	31	69	506
507	70	290	37,000	88,000	528 57	1 82	42	58	507
508	100	300	50,000	250,000	500 00	1 67	20	80	508
509	86	300	31,400	100,000	365 12	1 22	32	68	509
510	43	300	14,000	60,000	325 58	1 09	23	77	510
511	50	275	20,850	87,000	417 00	1 52	24	76	511
514	23	305	56,000	70,000	243 42	79	80	20	514
515	114	300	45,000	100,000	394 74	1 32	45	55	515
516	39	300	12,000	125,000	307 69	1 03	10	90	516
517	213	300	85,119	348,000	399 15	1 33	24	76	517
	1,813	Average 291	793,576	2,989,800	Average 407 10	Average 1 41	Average 31	Average 69	

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

BOOT AND SHOE FACTORIES.—TABLE No. 19.

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
1			$	$	$ c.	$ c.		%	1
518	164	300	95,888	311,000	584 68	1 95	31	69	518
519	58	278	23,907	176,500	421 90	1 52	14	86	519
520	47	300	19,200	52,000	408 51	1 36	37	63	520
521	68	290	26,200	71,100	385 29	1 33	37	63	521
522	45	300	17,647	90,000	392 16	1 31	20	80	522
523	76	303	31,894	170,000	419 66	1 39	19	81	523
524	505	284	205,808	1,133,598	407 54	1 44	18	82	524
525	158	300	71,300	310,000	451 27	1 50	23	77	525
526	135	300	57,300	265,000	424 44	1 41	22	78	526
527	164	300	95,880	311,000	584 63	1 95	31	69	527
528	26	280	11,000	49,000	423 08	1 51	22	78	528
529	67	305	24,500	84,000	365 67	1 20	29	71	529
530	42	300	13,879	62,852	330 45	1 10	22	78	530
531	116	305	53,065	460,000	457 46	1 50	12	88	531
532	4	305	900	6,000	225 00	74	15	85	532
533	20	305	13,850	50,000	692 50	2 27	28	72	533
534	107	300	45,174	135,000	422 19	1 41	33	67	534
535	285	300	135,823	1,000,000	476 57	1 59	14	86	535
536	26	300	10,800	60,000	415 38	1 38	18	82	536
537	93	300	33,000	200,000	354 84	1 18	17	83	537
538	61	276	26,200	123,555	429 51	1 56	21	79	538
539	90	300	32,564	88,000	361 82	1 21	37	63	539
540	5	100	500	1,200	100 00	1 00	42	58	540
541	78	300	33,750	152,000	432 69	1 42	22	78	541
542	43	305	25,000	60,000	581 40	1 91	42	58	542
	2,483	Average 289	1,105,029	5,421,805	Average 421 95	Average 1 45	Average 25	Average 75	

FURRIERS, HAT AND CAP FACTORIES—TABLE No. 20.

543	86	313	52,540	240,000	610 09	1 94	22	78	543
544	52	303	25,800	89,000	496 15	1 64	29	71	544
545	30	300	16,000	26,000	533 33	1 78	62	38	545
546	10	305	6,850	40,000	685 00	2 25	17	83	546
548	122	300	43,500	160,000	356 56	1 19	27	73	548
	300	Average 304	144,690	555,000	Average 536 23	Average 1 76	Average 31	Average 69	

TANNERIES, HARNESS FACTORIES, ETC.—TABLE No. 21.

549	41	305	31,519	106,663	768 76	1 52	30	70	549
550	258	308	128,934	1,080,000	499 74	1 62	12	88	550
551	71	300	34,300	190,000	483 10	1 61	18	82	551
552	84	295	31,833	200,000	378 96	1 28	16	84	552
553	26	300	13,647	148,344	524 89	1 75	9	91	553
554	13	300	5,620	71,432	432 31	1 44	8	92	554
555	650	300	226,810	800,000	348 78	1 16	28	72	555
556	107	311	55,896	792,000	522 38	1 68	7	93	556
557	129	308	73,000	530,000	565 89	1 84	14	86	557
558	3	312	1,500	25,000	500 00	1 60	6	94	558
559	2	300	720	5,000	360 00	1 20	14	86	559
560	3	305	2,000	8,000	666 67	2 19	25	75	

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

TANNERIES, HARNESS FACTORIES, ETC.—TABLE NO. 21.—*Continued.*

Schedule No	Number of persons employed.	Number of days in operation	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%		
561	142	300	50,800	245,000	357 75	1 19	21	79	561
562	26	270	13,000	130,000	500 00	1 85	10	90	562
563	7	300	2,825	20,000	403 57	1 35	14	86	563
564	19	300	8,144	42,000	428 63	1 43	19	81	564
565	220	310	140,700	2,000,000	639 55	2 06	7	93	565
566	28	310	17,360	55,000	627 14	2 02	32	68	566
567	49	300	21,000	80,000	428 60	1 43	26	74	567
568	27	300	12,278	127,500	454 74	1 52	10	90	568
569	49	285	17,155	62,628	350 10	1 23	27	73	569
570	2	300	600	10,000	300 00	1 00	6	94	570
571	3	300	1,152	2,500	384 00	1 28	46	54	571
572	8	300	3,050	9,000	381 25	1 27	34	66	572
573	266	300	100,500	500,000	377 82	1 26	20	80	573
574	27	300	14,000	60,000	518 52	1 73	23	77	574
	2,260	Average 301	1,008,543	7,300,067	Average 469 35	Average 1 52	Average 19	Average 81	

FLOUR AND FEED MILLS, CEREAL FOODS.—TABLE NO. 22

575	55	300	32,500	1,700,000	591 91	1 97	2	98	575
576	39	300	23,509	1,000,000	602 79	2 01	2	98	576
577	31	300	12,000	450,000	387 10	1 29	3	97	577
578	461	312	184,465	4,472,355	400 14	1 28	4	96	578
579	48	305	26,800	650,000	558 33	1 83	4	96	579
580	3	300	1,300	30,000	433 33	1 44	4	96	580
581	4	300	1,560	6,000	390 00	1 30	26	74	581
582	6	300	2,850	50,000	475 00	1 58	6	94	582
584	3	312	2,000	50,000	666 67	2 14	4	96	584
585	6	307	3,777	107,827	629 60	2 05	5	95	585
586	6	307	2,938	91,165	489 66	1 59	3	97	586
587	18	305	12,320	188,000	684 44	2 24	7	93	587
588	25	305	14,200	450,000	568 00	1 67	3	97	588
589	20	300	8,740	163,991	487 00	1 62	5	95	589
590	7	300	3,926	90,508	560 87	1 87	4	96	590
591	4	295	2,000	45,000	500 00	1 70	4	96	591
594	2	305	900	15,000	450 00	1 48	6	94	594
597	5	300	2,300	40,000	460 00	1 53	6	94	597
598	1	312	500	39,360	500 00	1 60	1	99	598
599	9	300	4,500	65,000	500 00	1 67	7	93	599
600	9	313	5,989	131,311	665 44	2 13	5	95	600
602	4	305	1,200	50,000	300 00	98	2	98	602
603	4	305	2,800	50,000	700 00	2 30	6	94	603
604	6	300	3,810	40,000	635 00	2 12	10	90	604
605	2	305	760	25,000	380 00	1 25	3	97	605
606	4	70	540	17,850	135 00	1 93	3	97	606
607	3	300	1,511	40,000	503 67	1 68	4	96	607
608	3	305	1,400	55,000	466 67	1 53	3	97	608
610	7	300	4,200	100,000	600 00	1 94	4	96	610
611	7	300	5,900	142,000	842 86	2 81	4	96	611
612	3	300	1,664	34,000	554 67	1 85	5	95	612
613	1	300	450	35,000	450 00	1 50	2	98	613
614	16	300	10,800	225,000	675 00	2 25	4	96	614
615	22	305	17,926	450,327	814 82	2 67	4	96	615
616	16	310	11,150	275,000	696 88	2 25	4	96	616

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

FLOUR AND FEED MILLS, CEREAL FOODS.—TABLE No. 22.—*Continued.*

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
617	31	300	22,000	600,000	709 68	2 37	4	96	617
618	11	300	7,774	109,173	706 73	2 35	7	93	618
619	7	300	2,776	42,058	396 57	1 32	7	93	619
620	13	300	7,370	150,000	566 92	1 89	5	95	620
621	2	300	1,075	31,250	537 50	1 79	3	97	621
622	10	290	7,246	89,000	724 60	2 50	8	92	622
623	11	312	7,266	135,000	665 45	2 13	5	95	623
624	12	313	7,400	200,000	616 67	1 97	4	96	624
625	34	305	17,600	560,000	517 65	1 70	3	97	625
627	2	300	750	13,720	375 00	1 25	5	95	627
628	1	120	100	5,000	100 00	83	2	98	628
629	8	300	3,520	72,918	440 00	1 47	5	95	629
630	17	300	10,676	344,100	628 00	2 09	3	97	630
631	15	300	12,824	240,800	854 93	2 85	5	95	631
632	2	305	1,200	12,000	600 00	1 97	10	90	632
634	2	310	936	30,000	468 00	1 50	3	97	634
635	23	305	12,835	46,328	558 04	1 83	28	72	635
636	9	295	5,400	65,000	600 00	2 00	8	92	636
638	6	200	3,500	50,000	583 33	2 91	7	93	638
639	3	300	1,500	15,000	500 00	1 67	10	90	639
640	26	300	13,368	300,000	514 11	1 71	4	96	640
641	4	305	1,800	60,000	450 00	1 48	3	97	641
642	5	300	2,880	13,400	576 00	1 92	21	79	642
644	14	300	10,700	300,000	764 29	2 55	4	96	644
645	2	305	1,236	40,000	618 00	2 03	3	97	645
646	3	305	1,500	45,000	500 00	1 64	3	97	646
647	2	174	603	5,200	260 00	1 49	12	88	647
649	6	300	3,000	45,500	500 00	1 67	7	93	649
650	18	312	8,000	250,000	444 44	1 42	3	97	650
651	9	300	5,949	145,300	661 00	2 20	4	96	651
652	2	305	985	47,800	492 50	1 61	2	98	652
653	7	280	4,510	60,000	644 29	2 30	8	92	653
654	15	300	10,750	100,000	716 67	2 39	11	89	654
655	5	300	2,500	93,500	500 00	1 67	3	97	655
656	7	305	4,500	110,000	642 86	2 11	4	96	656
657	23	306	13,113	205,174	570 00	1 87	6	94	657
658	9	310	6,700	50,000	744 44	2 40	13	87	658
	1,236	average 294	629,000	16,056,115	average 548 66	average 1 86	average 6	average 94	

BAKERS AND CONFECTIONERS.—TABLE No. 23.

659	7	312	5,000	25,000	714 29	2 29	20	80	659
660	34	290	16,802	95,000	494 18	1 70	18	82	660
661	99	290	31,171	215,000	314 86	1 09	14	86	661
662	41	305	25,500	303,000	621 95	2 03	8	92	662
663	65	282	26,800	350,000	412 31	1 45	8	92	663
664	56	300	24,348	144,000	434 79	1 45	17	83	664
665	366	300	125,000	700,000	341 53	1 14	18	82	665
666	83	300	21,766	90,000	262 24	87	24	76	666
667	66	305	36,633	147,437	555 00	1 82	25	75	667
	817	Average 298	313,020	2,069,437	Average 461 24	Average 1 54	Average 17	Average 83	

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

CANNING, PORK AND BACON FACTORIES.—TABLE No. 24.

Schedule No	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
134			$	$	$ c.	$ c.	%	%	
668	8	305	2,250	8,000	281 25	92	28	72	668
669	87	305	50,000	1,500,000	574 71	1 88	3	97	669
670	133	150	15,000	145,453	112 78	75	10	90	670
671	174	96	14,910	106,006	85 70	89	14	86	671
672	204	158	22,573	53,317	110 65	70	42	58	672
673	28	85	1,900	7,250	67 86	80	27	73	673
674	297	150	29,773	250,000	100 24	67	12	88	674
675	134	150	23,566	130,000	175 87	1 17	18	82	675
676	103	60	8,196	46,734	79 57	1 33	18	82	676
677	102	305	29,000	175,000	384 31	93	11	89	677
678	66	300	37,300	1,000,000	565 15	1 88	4	96	678
679	178	150	14,300	120,000	80 34	54	12	88	679
680	28	305	15,000	120,000	535 71	1 76	13	87	680
681	240	300	150,000	5,000,000	625 00	2 08	3	97	681
682	47	313	27,444	749,000	583 92	1 87	4	96	682
683	62	90	5,000	40,000	80 65	90	13	87	683
684	72	90	3,800	20,000	52 78	59	19	81	684
685	112	150	15,218	104,531	135 88	91	15	85	685
686	128	167	8,283	67,574	64 71	40	12	88	686
687	72	140	9,334	56,861	129 64	93	16	84	687
688	100	140	12,242	62,271	122 42	87	20	80	688
689	167	305	95,329	2,723,495	570 83	1 87	4	96	689
690	106	100	4,400	30,000	41 51	42	15	85	690
691	27	150	12,050	75,000	446 30	2 98	16	84	691
692	411	300	91,397	999,465	222 38	74	9	91	692
693	93	150	15,750	60,000	169 35	1 13	26	74	693
694	35	85	5,950	50,000	170 00	2 00	12	88	694
695	89	144	9,562	54,626	107 44	75	18	82	695
	3,303	Average 184	729,527	13,754,583	Average 238 75	Average 1 17	Average 15	Average 85	

DAIRY PRODUCTS AND OTHER FOODS.—TABLE No. 25.

696	5	313	2,400	65,095	480 00	1 53	3	97	696
697	13	40	1,000	3,600	76 92	1 92	28	72	697
698	58	305	15,000	120,000	258 62	85	13	87	698
699	6	313	1,715	15,000	285 83	91	11	89	699
700	125	280	73,447	433,718	587 58	2 10	17	83	700
701	44	50	4,200	10,000	95 45	1 91	42	58	701
702	127	305	59,328	599,581	467 15	1 53	10	90	702
703	25	305	13,020	130,000	520 80	1 71	10	90	703
704	167	305	71,000	770,000	425 15	1 07	9	91	704
705	1	305	700	14,000	700 00	2 30	5	95	705
706	54	312	24,000	570,000	444 44	1 42	4	96	706
707	10	300	4,930	30,600	493 00	1 64	16	84	707
708	15	305	6,760	21,090	450 67	1 48	32	68	708
709	61	305	43,000	300,000	704 92	2 31	14	86	709
710	3	200	1,200	14,517	400 00	2 00	8	92	710
711	11	220	4,656	12,449	423 27	1 92	37	63	711
712	32	235	9,775	25,287	305 47	1 30	39	61	712
713	12	313	3,486	57,952	290 50	93	6	94	713
714	6	90	1,540	3,000	256 67	2 85	51	49	714
715	44	305	27,848	283,621	632 91	2 08	10	90	715
	819	Average 255	369,000	3,479,510	Average 414 97	Average 1 69	Average 18	Average 82	

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

DISTILLERIES, BREWERIES, AND TOBACCO FACTORIES.—TABLE No. 26.

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
716	103	300	30,000	96,500	292 62	98	31	69	716
717	139	300	61,800	200,000	444 60	1 48	31	69	717
718	49	325	24,600	77,000	502 04	1 54	32	65	718
719	16	300	9,800	70,000	612 50	2 04	14	86	719
720	11	313	7,600	30,000	690 91	2 21	25	75	720
721	4	305	8,050	3,000	512 50	1 68	68	32	721
722	9	300	6,500	25,000	733 33	2 44	26	74	722
723	18	300	12,062	111,580	670 11	2 23	11	89	723
724	197	312	114,109	462,000	579 23	1 86	25	75	724
725	102	300	33,200	96,000	325 49	1 08	35	65	725
726	5	305	2,600	16,000	520 00	1 70	18	82	726
727	7	305	3,084	20,000	440 57	1 44	15	85	727
729	7	365	6,000	30,000	857 14	2 35	20	80	729
730	16	305	9,040	40,695	565 00	1 85	22	78	730
731	8	75	2,290	13,500	286 25	3 82	17	83	731
732	59	313	40,100	125,000	679 66	2 17	32	68	732
733	12	312	8,500	22,500	708 33	2 27	33	67	733
734	491	300	251,302	819,663	511 82	1 71	31	69	734
735	233	270	118,138	1,463,241	507 03	1 88	8	92	735
736	8	313	5,628	22,500	703 50	2 25	25	75	736
737	30	300	13,868	118,000	462 27	1 54	12	88	737
738	16	306	13,210	62,000	525 63	2 70	21	79	738
739	9	312	6,460	20,000	717 77	2 30	32	68	739
740	1	200	416	5,000	416 00	2 08	8	92	740
741	8	305	3,125	32,000	390 62	1 28	10	90	741
742	81	295	43,274	156,934	534 25	1 81	28	72	742
743	5	300	2,072	5,250	414 40	1 38	39	61	743
744	15	312	9,000	80,000	600 00	1 92	11	89	744
745	6	365	3,326	14,500	554 33	1 52	23	77	745
746	5	300	3,800	25,000	760 00	2 53	15	85	746
747	6	313	3,803	25,200	634 00	2 03	15	85	747
748	3	300	2,370	10,000	790 00	2 63	22	78	748
749	22	311	11,902	55,600	541 00	1 74	21	79	749
750	42	305	25,746	205,837	613 00	2 01	13	87	750
751	30	300	22,681	207,490	756 33	2 52	11	89	751
752	208	306	209,650	617,000	1,007 93	3 29	34	66	752
	1,981	Average 296	1,123,106	5,383,990	Average 589 45	Average 2 01	Average 23	Average 77	

CHEMICAL WORKS.—TABLE No. 27.

753	6	300	2,100	15,000	350 00	1 17	14	86	753
754	5	100	2,436	8,000	487 20	4 87	30	70	754
755	9	305	5,978	56,828	664 22	2 11	11	89	755
756	9	300	13,700	100,000	1,522 22	5 07	14	86	756
757	17	120	6,012	16,993	353 65	2 95	35	65	757
758	30	300	16,719	71,536	557 30	1 86	23	77	758
759	130	300	49,171	329,774	378 24	1 26	15	85	759
760	124	258	32,418	122,509	261 44	1 01	26	74	760
761	8	300	6,100	33,000	762 50	2 54	18	82	761
762	19	275	7,780	39,729	409 47	1 49	20	80	762
763	39	300	23,600	95,000	605 13	2 02	25	75	763

TABLE SHOWING WAGES AND SALARIES AND SHARE OF PRODUCT.—*Continued.*

CHEMICAL WORKS.—TABLE No. 27—Continued.

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
764	13	305	9,100	45,600	700 00	2 30	20	80	764
765	223	365	115,140	600,000	516 32	1 41	19	81	765
766	42	300	17,500	125.000	416 67	1 39	14	86	766
767	2	200	420	2,900	210 00	1 05	14	86	767
768	7	305	2,950	15,000	421 43	1 38	20	80	768
769	80	305	44,700	340,000	558 75	1 83	13	87	769
	763	Average 273	355,824	2,016,869	Average 539 68	Average 2 10	Average 19	Average 81	

OIL, PAINT AND VARNISH FACTORIES.—TABLE No. 28.

770	64	280	38,735	268,669	605 23	2 16	14	86	770
771	25	310	25,225	163,500	1,009 00	3 26	15	85	771
772	14	305	9,588	44,500	684 86	2 25	22	78	772
773	4	300	2,500	18,500	525 00	2 08	14	86	773
774	5	306	2,510	18,000	502 00	1 64	14	86	774
775	17	304	15,383	167,459	904 88	2 98	9	91	775
777	71	280	37,350	180,000	526 06	1 88	21	79	777
779	11	311	4,954	20,000	450 36	1 45	25	75	779
780	9	313	6,072	126,634	674 70	2 16	5	95	780
781	12	365	6,000	50,000	500 00	1 37	12	88	781
	232	Average 307	148,317	1.057,262	Average 638 21	Average 2 12	Average 15	Average 85	

GAS AND ELECTRIC LIGHT, HEAT AND POWER WORKS.—TABLE No. 29.

782	16	365	.8,075	36,420	504 69	1 38	22	78	782
783	11	365	6,600	10,000	600 00	1 64	66	34	783
784	5	365	1,850	5,000	370 00	1 01	37	63	784
785	3	365	983	7,500	327 67	90	13	87	785
786	3	365	850	10,900	283 33	78	8	92	786
787	992	365	694,619	1,990,129	700 22	1 92	35	65	787
788	4	365	1,270	4,000	317 50	87	32	68	788
789	4	365	2,600	7,000	650 00	1 78	37	63	789
790	3	365	2,200	9,000	733 33	2 01	24	76	790
791	2	365	600	5,967	300 00	82	11	89	791
792	6	365	3,700	8,000	616 67	1 69	46	54	792
793	7	365	3,088	15,000	441 14	1 21	21	79	793
794	5	365	2,505	12,186	501 00	1 37	21	79	794
795	15	365	12,318	129,551	821 20	2 24	10	90	795
796	21	365	14,780	140,000	703 81	1 93	11	89	796
797	4	365	929	5,183	232 25	64	18	82	797
798	129	365	65,238	216,191	505 72	1 39	31	69	798
799	51	365	36,397	150,000	713 67	1 96	24	76	799
800	9	365	4,800	16,000	533 33	1 46	30	70	800
801	6	365	3,678	16,078	613 00	1 68	23	77	801
802	3	365	1,096	4,555	365 33	1 00	24	76	802
803	12	365	9,240	36,000	770 00	2 11	26	74	803
804	165	365	112,969	495,509	684 66	1 88	23	77	804
	1,476	Average 365	990,385	3,330,169	Average 534 28	Average 1 46	Average 26	Average 74	

TABLES SHOWING WAGES AND SALARIES AND SHARE PRODUCT.—*Concluded.*

PRINTING AND ALLIED TRADES.—TABLE No. 30.

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
			$	$	$ c.	$ c.	%	%	
805	58	305	29,890	120,000	515 34	1 69	25	75	805
806	113	300	62,082	196,039	549 40	1 83	32	68	806
807	24	305	18,570	45,679	773 75	2 54	41	59	807
808	21	305	15,693	40,000	747 29	2 45	39	61	808
809	63	305	34,800	110,000	552 38	1 81	32	68	809
810	5	305	2,450	6,700	490 00	1 61	37	63	810
811	165	305	109,500	200,000	663 64	2 18	55	45	811
812	125	305	39,303	70,466	314 42	1 03	56	44	812
813	15	300	6,762	14,467	450 80	1 50	47	53	813
814	177	305	92,000	268,821	786 32	2 55	34	66	814
815	113	305	56,000	175,000	495 58	1 62	32	68	815
816	8	313	3,186	5,058	398 25	1 27	63	37	816
817	97	305	70,800	92,000	729 90	2 39	77	23	817
818	32	300	17,000	25,000	531 25	1 77	68	34	818
819	3	300	1,100	2,900	366 67	1 22	38	62	819
820	34	310	31,400	40,000	923 53	2 98	78	22	820
821	2	312	850	3,800	425 00	1 36	22	78	821
822	17	305	8,000	18,000	470 59	1 54	44	56	822
823	3	310	984	10,000	328 00	1 06	9	91	823
824	45	300	18,950	56,000	421 11	1 40	34	66	824
825	23	305	13,569	30,460	589 96	1 93	45	55	825
826	40	300	22,200	45,000	555 00	1 85	49	51	826
827	5	303	1,925	4,250	385 00	1 27	45	55	827
828	6	305	1,850	4,000	308 33	1 01	46	54	828
829	17	303	13,705	32,715	806 18	2 66	42	58	829
830	7	301	3,848	5,248	549 71	1 83	71	29	830
	1,220	Average 305	676,417	1,621,603	Average 543 3(	Average 1 78	Average 45	Average 55	

BRICK, TILE AND PORTLAND CEMENT WORKS.—TABLE No 31.

831	130	225	47,000	325,000	361 54	1 67	14	86	831
832	212	312	140,981	192,292	665 00	2 13	73	27	832
833	27	300	17,045	46,391	631 30	2 10	37	63	833
834	15	300	10,000	22,000	666 67	2 22	45	55	834
835	17	301	7,476	14,994	439 76	1 46	50	50	835
836	3	225	1,374	4,200	458 00	2 04	33	67	836
837	208	300	43,523	100,000	209 25	70	43	57	837
838	1,933	365	1,474,193	7,214,165	762 65	2 09	20	80	838
840	191	305	109,465	203,000	573 12	1 88	54	46	840
841	50	70	16,000	30,400	320 00	4 57	53	47	841
842	68	236	24,249	184,827	356 60	1 51	13	87	842
843	9	305	5,000	12,000	555 55	1 82	42	58	843
844	33	300	20,000	50,000	606 06	2 02	40	60	844
845	43	275	31,000	175,000	720 93	2 62	18	82	845
846	10	300	5,800	18,000	580 00	1 93	32	68	846
847	5	300	2,600	20,000	520 00	1 73	13	87	847
848	58	200	30,809	111,000	531 19	2 65	28	72	848
849	35	300	19,876	56,324	567 89	1 89	35	65	849
851	31	305	14,130	91,068	455 81	1 49	16	84	851
852	72	200	15,400	25,000	213 89	1 07	62	38	852
854	25	305	15,249	32,581	609 96	2 00	47	53	854
855	22	120	9,100	22,000	413 64	3 45	41	59	855
856	41	180	17,830	53,121	434 93	2 42	34	66	856

TABLES SHOWING WAGES AND SALARIES AND SHARE PRODUCT.—*Continued.*

BRICK, TILE, ETC.—TABLE No. 31—*Continued.*

Schedule No.	Number of persons employed.	Number of days in operation.	Amount paid in wages and salaries.	Gross value of product.	Employees' average annual earnings.	Employees' daily rate of pay.	Per cent. wages of gross value of product.	Per cent. cost of material, interest, insurance, taxes, etc., and profit.	Schedule No.
857	13	300	9,500	12,000	730 08	2 43	79	21	857
858	20	100	5,600	10,220	280 00	2 80	55	45	858
859	24	210	11,115	20,167	463 12	2 20	55	45	859
860	30	175	8,078	17,050	269 26	1 54	47	53	860
861	69	250	36,000	135,000	521 74	2 04	27	73	861
862	298	312	237,128	367,974	795 70	2 55	64	36	862
863	84	290	57,606	121,016	685 80	2 36	48	52	863
864	16	305	11,400	54,000	712 50	2 34	21	79	864
	3,792	Average 257	2,454,527	9,740,790	Average 519 74	Average 2 12	Average 40	Average 60	

MISCELLANEOUS INDUSTRIES—TABLE No. 32.

865	39	313	26,664	91,000	683 69	2 18	29	71	865
866	50	305	10,392	100,000	207 84	68	10	90	866
867	7	200	3,840	9,860	548 57	2 74	39	61	867
868	72	300	25,000	100,000	347 22	1 16	25	75	868
	168	Average 280	65,896	300,860	Average 446 83	Average 1 69	Average 26	Average 74	

SUMMARY OF 32 TABLES.

57,991	Average 286	28,022,416	139,990,138	Average 495 10	Average 1 74	Average 27.53	Average 72.47	

INCREASE OR DECREASE OF PRODUCT AND OF WAGES.

The following figures, calculated from the preceding tables, show the average increase or decrease in value of product reported by each classified industry, and the number of establishments reporting unspecified increases or decreases, or no change from the previous year. Succeeding columns show the average increases in wages as stated in the schedules and the number of establishments reporting unspecified increases or decreases or no change. The concluding column gives the number of persons in the establishments benefiting by the increase of wages.

INCREASE OR DECREASE OF PRODUCT AND OF WAGES.

No.	Industries.	Product.					Wages.					
		Average increase.	Average decrease.	Increase not specified.	Decrease not specified.	Same amount.	Average increase.	Average decrease.	Increase not specified.	Decrease not specified.	Same rate of wages.	Number benefited.
		%	%	No.	No.	No.	%	%	No.	No.	No.	No.
1	Lumber, Saw Mills	10.3	.....	3	4	24	9.6	.....	2	1	26	2,610
2	Planing Mills, etc.	8.9	.....	2	....	9	8.0	.....	1	....	7	1,329
3	Woodenware specialties	14.1	.....	2	....	12	10.9	.....	6	....	8	1,421
4	Furniture, etc.	21.6	.....	....	....	7	8.5	.....	4	....	5	3,411
5	Carriages, etc.	26.7	.....	....	....	7	9.3	.....	2	....	6	2,074
6	Agricultural Implements	21.0	.....	2	....	5	17.1	.....	1	....	6	251
7	Pianos, Organs, etc.	21.0	.....	....	1	3	4.5	.....	....	....	....	177
8	Wood Pulp and Paper	17.4	.....	2	....	2	10.6	.....	2	1	6	280
9	Foundries, Rolling Mills, etc.	18.8	.....	1	1	3	8.7	.....	....	....	10	1,670
10	Stove Factories	18.3	.....	1	....	2	7.8	.....	4	....	3	1,096
11	Machinery, etc.	13.6	.....	4	....	17	8.0	.....	4	....	15	2,011
12	Metallic Roofing, etc.	19.0	.....	2	....	3	8.0	.....	4	....	3	1,859
13	Wire Goods	11.1	.....	1	1	4	10.0	.....	1	....	7	447
14	Brassware	13.5	.....	4	....	2	9.1	.....	4	....	2	887
15	Silverware	3.7	.....	....	....	....	7.1	.....	1	....	....	420
16	Woollens, Cottons, etc.	7.1	.....	3	4	10	11.7	.....	3	....	9	533
17	Knitted Goods	10.7	.....	2	....	1	9.8	.....	5	....	6	1,179
18	Clothing, etc.	10.4	.....	2	....	2	8.9	.....	3	1	7	883
19	Boots and Shoes	10.1	.....	....	....	3	6.1	.....	1	....	5	1,643
20	Furs, Hats and Caps	16.3	.....	....	....	2	16.7	.....	2	....	....	294
21	Tanneries, Leather Goods	9.6	.....	1	....	5	6.9	.....	1	....	5	1,394
22	Flour Mills, etc.	11.4	.....	4	2	32	8.9	.....	8	....	38	712
23	Bakeries, etc	10.0	.....	....	1	....	7.0	.....	1	....	2	337
24	Canning, Pork Packing, etc.	26.4	.....	2	....	4	11.3	.....	2	....	8	2,311
25	Dairy Products, etc.	8.7	.....	1	1	6	17.3	.....	1	....	15	638
26	Distillers, Brewers, Cigars, etc.	8.0	.....	1	....	5	10.1	.....	1	....	15	782
27	Chemical Works, etc.	15.8	.....	2	....	2	11.7	.....	2	....	6	364
28	Oils, Paints, etc.	12.4	.....	1	....	2	6.7	.....	....	....	6	50
29	Gas, Electric Works, etc.	5.6	.....	2	....	2	5.4	.....	2	1	8	1,407
30	Printing, etc.	15.5	.....	3	....	....	11.1	.....	3	....	3	975
31	Bricks, Cement, etc.	9.6	.....	2	....	7	9.4	.....	1	....	12	2,705
32	Miscellaneous	15.0	.....	....	....	....	10.3	.....	....	....	....	157
	Totals and averages	aver 13.83	aver	50	15	183	aver 9.58	aver	72	4	249	36,297

CHANGES OF WAGES AND HOURS.

Bartenders at Toronto received increases.

Brewery workers, to the number of 117, at London, received an advance, first year 6 per cent., second year 4 per cent., third year 2 per cent., and a reduction of hours per week, 3½ for six months, and seven for six months from May 1st.

Brewery workers at Ottawa, to the number of 40, received an increase of $1 a week and a reduction in time of 5 hours.

Brewery workers at St. Catharines, to the number of 18, received an increase of $1.50 a week from March 16.

Bricklayers, to the number of 100, at Brantford, received an increase of 2c. per hour from May 1st.

Bricklayers (30), at Brockville, got an increase of 25c. per day from April 15th.

Bricklayers (60), at Guelph, got an increase of 1½c. per hour from April 1.

Bricklayers, to the number of 150, at Hamilton, received an increase of 5c. per hour from May 8.

Bricklayers (60), at Kingston, got an increase of 5c. per hour from May 1.

Bricklayers, to the number of 60, at London, received an increase of 2½c. per hour from May 1.

Bricklayers and helpers, at Orillia, to the number of 40, had their hours reduced from 10 to 9 from May 1.

Bricklayers (41), at Welland, got an increase of 5c. per hour and reduced time from May 1.

Brickmakers, to the number of 96, at Hamilton, received an increase of 2c. per thousand.

Broom and whisk makers, to the number of 16, at Hamilton, received an increase of $2 per week.

Builders labourers, to the number of 25, at Hamilton, received an increase of 3½c. per hour on June 11.

Builders' labourers, to the number of 140, at Hespeler, Preston, and Galt, received increases of 2½c. per hour from May 18.

Builders' labourers, at Ottawa, received an increase of 2c.

Carpenters (40), at Bridgeburg, had increase of 10c. per hour and reduced time.

Carpenters, to the number of 40, at Brockville, laying hardwood floors, had an increase of 5c. per hour from May 1.

Carpenters, at Guelph, had an increase of 5c. per hour from May 1.

Carpenters, to the number of 80, at Kingston, had an advance of 20c. per day from June 3.

Carpenters at Ottawa, to the number of 900, had increases.

Carpenters at Port Arthur had increases and reduced time.

Carpenters, at Toronto, to the number of 2,000, had an increase of 3c. per hour from May 1.

Cigar-makers, at Hamilton, to the number of 300, had an increase of $1 per thousand.

Cigar-makers, at St. Catharines, received an increase of $2 per week from May 1.

Cigar-makers, at Stratford, had an increase of $1 per m. from May.

Civic employees at Toronto received increases.

Civic labourers, at Brockville, to the number of ..., received an increase of 5c.

Civic light plant men, at Kingston, received increases.

Civic teamsters, at Ottawa, to the number of 50, received advances.

Cordage employees (300), at Welland, received an increase of 5 per cent.

Cloakmakers, to the number of 55, in Toronto, received advances on piece work prices of 10 and 15 per cent. from Jan. 28.

Coremakers in Brantford, to the number of 12, got an advance of 10c. per day from Feb. 15.

Corporation labourers, to the number of 200, at Hamilton, received an increase of 2c. per hour.

Corporation labourers, at Niagara Falls, received an increase of 25c. per day.

Corporation labourers, at Ottawa, to the number of 70, received an increase of 2c. per hour.

Corporation teamsters, to the number of 45, at Berlin, received an increase of 5c. per hour from April 1.

Electric workers (90), at Ottawa, obtained an increase of 5c. per hour and reduction of 6 hours per week.

Employees of Board of Works in North Toronto had pay raised to 27½c. per hour.

Firemen, at Chatham, received advances of $30 and $35 a year.

Firemen, at Hamilton, to the number of 71, received increases.

Firemen, at Lindsay, received increases of $25 a year.

Firemen, at London, received advances of 10c. a day.

Firemen, at Ottawa, to the number of 70, received advances of $50 a year and extra day off.

Firemen, at Peterborough, received advances.

Firemen, at St. Thomas, received advances from $80 to $160 per year.

Freight handlers, at Port Arthur, to the number of 250, received an increase of 2c. per hour on Aug. 5.

Hydro-Electric Employees, at London, received increases on March 1.

Iron moulders, at Belleville, to the number of 8, received an increase of 25c. per day.

Iron moulders, at Brantford, to the number of 32, received an advance of 10c. per day on Feb. 15.

Iron moulders, at Peterboro, to the number of 14, had time reduced 1 hour per week, with same wages.

Journeymen tailors, at St. Thomas, received an advance of about 5 per cent.

Labourers (30), at Brockville, received an increase of $3 per week.

Labourers, at Hamilton, got an increase from 20c. to 22c. per hour.

Labourers, at Peterboro, received increases.

Labourers, to the number of 100, at Ottawa, got an increase of $1.08 per week.

Lathers, at Toronto, received an increase of 3c. per hour.

Machinists, moulders, and coremakers, at Hamilton, to the number of 300, received increases from $2.25 to $2.75 per day on May 8.

Machinists and helpers, to the number of 39, at Ottawa, received increases of 10 per cent. skilled and 7 per cent. unskilled.

Machinists on P. M. R., at St. Thomas, to the number of 50, got an advance of 1c. per hour.

Masons, bricklayers, and plasterers, at Brockville, to the number of 30, had wages raised 25c. per day.

Masons, bricklayers, and plasterers, at Guelph, to the number of 60, had wages raised 1½c. per hour.

Masons, at Kingston, received increases.

Mechanics in building trades, at Kingston, to the number of 16, received an increase of $2.40 per week.

Miners underground had hours reduced to 8 per day.

Moulders, at Belleville, receive an increase of 25c. per day.

Moulders and coremakers, at Hamilton, to the number of 40, received increases.

Moulders, at Ottawa, received increases.

Moulders, at Peterborough, obtained reduction of hours.

Painters and decorators (37), at St. Catharines, received increases of 5c. per hour from April 22.

Painters and decorators, at Hamilton, to the number of 61, got increases of 2½c. per hour on March 1.

Plasterers to the number of 100, at Hamilton, received an increase of 5c. per hour from May 1.

Plasterers, at London, received an increase of 3c. per hour.

Plasterers, to the number of 66, at Ottawa, received an increase of 5c. per hour.

Plumbers, to the number of 80, at Kingston, received an increase of 20c. per day and a reduction of 1 hour.

Plumbers, at Port Arthur, received 5c. per hour increase and 4 hours reduction.

Police-constables, at Berlin, got an increase of $100 to $200 a year.

Police-constables, at Chatham, received an increase of $5 per month.

Police-constables, at Guelph, got increases of $50 and upwards per year.

Police-constables, at Hamilton, got an increase of $50 and upwards.

Police-constables, at Niagara Falls, got increases.

Police-constables, at Peterboro, got increases from $50 to $100.

Police-constables, at St. Thomas, received increases of $60 to $100.

Police-constables, to the number of 175, in Toronto, received $50 per year increase.

Printers in Hamilton, to the number of 67, received increases ranging from $2 to $5 per week.

Pulp-makers, in Sault St. Marie, to the number of 25, received an increase of 3½c. per hour from Aug. 6.

Railway telegraphers on G. T. R., to the number of 772, got increases for overtime on Sundays.

Sheet metal workers, at Hamilton, to the number of 52, received increases of 2½c. per hour from May 1.

Shirt ironers (44), at Hamilton, received increase.

Steelworkers (200), at Hamilton, received an increase of 15c. per hour.

Stereotypers, at Toronto, got increases of $2 per week.

Stokers, at St. Thomas, to the number of 12, received an increase of $1 per week from May 1.

Stonecutters, to the number of 50, at Ottawa, received an increase of 3c. per hour from Sept. 1.

Street labourers, at Toronto, to the number of 300, were advanced from $2 to $2.25 per day.

Street railway employees, to the number of 25, at Berlin and Waterloo, received an increase of ½c. per hour from June 1.

Street railway employees, to the number of 25, at Guelph, received an increase of 1½c. per hour from June 1.

Street railway employees, to the number of 180, at Hamilton, received an increase of 2c. per hour and a reduction of 11 hours per week by legislation.

Street railway employees, to the number of 98, at London, received increases of 1c. and 2c. per hour from Jan. 1.

Street railway employees, to the number of 457, at Ottawa, received increases of 1c. and 2c. per hour from Jan. 1, and 2½c. per hour on July 1.

Street railway employees, at St. Thomas, received an increase of 1c. per hour.

Street railway employees, at Toronto, received an increase of 2½c. per hour on June 16.

Tailors, to the number of 16, at Berlin, received increases; men $3 per week and women 5c. per hour.

Team owners, to the number of 50, at Walkerville and Windsor, received increases of $3 per week, and reduction in hours of 10 to 9.

Teamsters (45), at Berlin, received an increase of 5c. per hour from April 1.

Teamsters, to the number of 60, in Hamilton, received increases of 13c. per hour.

Teamsters, at Ottawa, received advances.

Teamsters, at Port Arthur, received an increase of $1 per day.

Textile mill hands, to the number of 105, at Hamilton, received 5 per cent. increase in piece work from April 15.

Textile mill hands, at Kingston, received an increase of 5 per cent. in piece work from Jan. 1.

Theatrical musicians, in Toronto, received an increase of $3 per week.

Theatrical stage employees, at Hamilton, received an increase of 27c. on Aug. 19.

Tobacco workers, to the number of 155, at Hamilton, received an increase of 5 per cent. on May 4.

Trackmen, on the Northern Division of G. T. R., got an increase of 15c. per hour.

Waterworks and hydro-electric employees, at London, got increases.

Web pressmen, to the number of 8, at Hamilton, received increases of $3 per week from June 1.

CO-OPERATIVE ASSOCIATIONS.

Co-operative societies in Canada, especially in Ontario, are making some progress, but very inconsiderable as compared with their growth in the United Kingdom and other countries.

There is a Co-operative Union of Canada, with which the following societies are in affiliation:

The following statistics for 1911 are given by "The Canadian Co-operator," the organ of the Union:—

CANADIAN CO-OPERATIVE STATISTICS FOR 1911

Name of Society	Years Established	No. of Members	Capital. Share and Loan	Reserve Fund	Value of stock in Trade	Other Assets	No. of Emp. at Dec. 31	Salaries and Wages Paid	Sales for the Year	Increase	Rate of Interest Paid	Purchase Divd. Paid	Net Profits	Total of Purchase Dividend Paid	Lines of Merchandise Handled
Broadview, Sask. The Saskatchewan Purchasing Co., Limited	1½	271	Shares $21,000	.....	$21,183.94	$4,626.00	....	$1,735.99	$39,992.09	.....	....	....	$1,238.31	.....	Farm Machinery, Binder Twine, Buggies, Harness, Lumber, Hardware, Dry Goods, Boots, Shoes, Groceries.
Dominion, N.S. The Workmen's Store Co., Limited	9	437	Shares (withdrawable) $26,480.63	$6,391.31	26,903.40	20,845.19	20	6,791.20	129,777.13	$37,773.87	6 %	10%	15,231.01	$8,669.03	General Merchandise.
Glace Bay, N.S. Co-operative Society, Limited	5½	727	Share $10,137.50 Loan 22,866.12 $33,003.62	8,316.22	54,411.60	33,013.43	31	13,092.94	198,879.29	53,825.91	5 "	8 "	.....	16,072.84	General Groceries, Dry Goods, Clothing, Boots, Shoes, Gent's Furnishings.
Guelph, Ont. Co-operative Association, Limited	8	565	Shares $4,581.00 Loan 10,561.28 $15,142.28	3,500.00	10,884.91	15,315.53	22	Distributive $6,788.00 Productive $2,808.00 $9,586.00	95,765.98	14,067.01	5 "	4 "	5,148.07	3,005.00	Bakery, Groceries, Butchery, Crockery, Boots, Shoes, Enamel, Tinware and Coal.
Inverness, N.S. Co-operative Society, Limited	5	159	Share $8,166.17 Loan 3,018.20 $11,184.37	2,198.17	14,167.92	4,052.80	6	2,398.40	40,802.18	2,451.29	7 "	7 "	2,964.74	2,117.26	General Merchandise.
Magog, P.Q. Society Co-operative	1½	126	Share $1,581.00 Loan 500.00 $2,081.39	158.00	2,400.00	.....	2	1,900.00	.....	.....	6 "	....	800.00	700.00	Groceries.
Valleyfield, P.Q. Industrial Co-operative Society, Limited	8½	120	Share $4,094.39 Loan 1,000.00 $5,094.39	601.05	5,285.83	3,582.47	4	2,238.83	39,175.56	4,042.03	6 "	7 "	2,527.83	2,462.01	Groceries, Boots and Shoes.
New Westminster, B.C. Co-operative Association, Limited	3	310	Shares $8,142.94	906.23	7,019.19	3,331.76	7	5,786.85	65,409.53	10,559.33	5 "	7 "	4,753.48	3,702.11	Groceries.
Ottawa, Ont. The Civil Service Co-operative Supply Association, Limited	1	470	Debt's $1,650.00 Shares $1,400.00 Loan 520.09 $1,920.00	.....	4,100.60	1,868.00	....	3,379.81	34,505.03	.....	5 "	....	170.91	.....	Groceries.
Preston, Ont. Co-operative Association, Limited	3	174		.....	2,200.00	800.00	3	1,600.00	17,000.00	3%	5 "	5 "	1,400.00	700.00	Groceries, Provisions, Feed, Fruit.
St. Thomas, Ont. Ideal Co-operative Association, Limited	1	98	Shares $1,475.00	.....	1,132.10	2,175.21	3	.....	13,803.81	.....	5 "	....	172.00	.....	Groceries.
Sydney Mines, N.S. Co-operative Association, Limited	6	331	Shares $16,608.03	3,000.00	18,805.05	13,291.64	17	7,397.25	111,180.78	*3,190.37	5 "	9½ "	10,126.48	9,910.10	Groceries, Dry Goods, Boots, Shoes, Hardware, Crockery, Furniture.

Note.—Blanks indicate no information has been given thereon. The Broadview, Ottawa and St. Thomas figures were compiled by the editor from their balance sheets. The information as to other societies is supplied by the respective secretaries. The societies at Paris, Ont., and Coleman, Alta., having been affiliated more recently, are not included in the above table. Under "British News," which follows later in this report, some information is given as to co-operation in the United Kingdom. *Decrease.

SOCIETIES IN AFFILIATION.

ONTARIO.

The Guelph Co-operative Association, Limited, Guelph.
The Preston Co-operative Association, Limited, Preston.
The Ideal Co-operative Association of St. Thomas, Limited.
The Civil Service Co-operative Supply Association, Ottawa.
The Twin City Co-operative Association, Limited, Berlin.
The Paris Co-operative Society, Limited, Paris.

QUEBEC.

L'Avenir de Magog, Société Co-Operative, Magog.
The Industrial Co-operative Society of Valleyfield, Limited, Valleyfield.
Lachine Co-operative Society, Lachine Locks.

NOVA SCOTIA.

The British-Canadian Co-operative Society, Ltd., Sydney Mines.
The Workmen's Store Co., Limited, Dominion.
The Inverness Co-operative Society, Limited, Inverness.
The Glace Bay Co-operative Society, Limited, Glace Bay.

BRITISH COLUMBIA.

The New Westminster Co-operative Association, Ltd., New Westminster.

SASKATCHEWAN.

The Saskatchewan Purchasing Co., Limited, Broadview.

ALBERTA.

The Western Canadian Co-operative Trading Co., Ltd., Coleman.

AMERICAN FEDERATION OF LABOUR.

Mr. Frank Morrison, Secretary of the American Federation of Labour, in his thirty-second report, presented at the annual convention of that body held at Rochester, N.Y., gives statistics for the past year. These figures are of interest to wage earners and others of Ontario, as showing the movements, changes of wages, hours of labour, benefits distributed, etc., by the International Trades and Labour Unions of the United States and Canada.

Mr. Morrison says:—

CHARTERS—Reports from the Secretaries of 78 of our National and International organizations furnish us with the information that 2,388 charters have been issued during the past year, and 1,422 surrendered—2,190 of the charters surrendered were locals of the National and International Unions, and 198 affiliated direct with the American Federation of Labour.

GAIN IN MEMBERSHIP—The gain in membership reported by the Secretaries of 51 International organizations over the membership on the first of September last year is 216,012.

STRIKES—Reports from 64 National and International organizations and from local unions directly affiliated with the American Federation of Labour show that there were 716 strikes, in which there were 73,069 involved. Of that number 200,302 were benefited and 6,177 not benefited. The total cost of the strikes reported on was $1,986,263.49. Adding to that amount $156,889.72, donations made by local unions to other unions, we have a total of $2,143,153.21 expended to sustain members on strike during the past year.

The following tables are from Mr. Morrison's report:—

Organizations.	Charters issued	Charters surrendered.	Gain in membership.	Number of strikes.	Strikes won.	Strikes compromised.	Strikes pending.	Strikes lost.	Number involved.	Number benefited.	Number not benefited.	Reduction in hours per day.	Gain in wages.	Cost of strikes.	Donations to other unions.
														$ c.	$ c.
A. F. of L. locals	198	205	1,706	29	8	2	16	3	2,058	1,232	377	.....	.....	†70,825 33	4,219 20
Asbestos Workers	5	2	300	5	3	1	1	....	200	200	.....	1 hr.	*r* 50c per day	.....	.....
Bakers	20	6	2,185	25	15	2	8	....	2,002	1,893	109	1 hr.	10%	22,133 00	2,859 66
Barbers	34	22	1,160	2	2	....	....	....	21	21	.....	½ hr.	20c per day	343 00	8,041 90
Bill Posters	198	.....	.....	1	....	....	1	....	16	.....	.....	.....	.....	.....	.....
Blacksmiths	14	15	.....	1	....	....	1	....	3,800	3,400	400	.....	12c per day	55,000 00	.....
Boilermakers	33	35	.....	95	....	....	90	5	6,020	.....	2,953	.....	.....	147,819 58	723 30
Bookbinders	10	2	.....	4	....	....	....	....	.....	.....	.....	.....	10%	3,082 51	.....
Boot and Shoe Workers	15	13	1,167	4	2	....	1	1	439	*a*	19	.....	.....	17,157 57	15,000 00
Brewery Workmen	44*b*	43*c*	.....	40	31	3	3	3	2,026	1,902	124	.....	25c	8,210 00	2,752 90
Brick, Tile & Terra Cotta Wkrs	12	5	.....	4*d*	1	1	2	....	700	935	.....	.....	.....	2,000 00	.....
Bridge & Structural Iron Wkrs.	7	4	1,000	3	3	....	....	....	2,000	2,000	.....	.....	.....	.....	3,000 00
Broommakers	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Brushmakers	1	.....	11	1	1	1	....	....	14	14	.....	4 hrs.p.wk.	$2.00 p. wk.	134 00	10 00
Carpenters, Brotherhood	153	162	4,000	15	10	4	....	1	1,000	1,000	.....	1 per day	2½ to 5c p. hr.	16,446 00	.....
Carriage and Wagon Workers	7	2	.....	2	2	....	....	....	200	200	.....	.....	25c per day	600 00	.....
Carvers, Wood	.....	.....	.....	1	1	....	....	....	3	98	.....	6 hrs.p.wk.	2½c p. hr.	89 33	78 00
Cement Workers	32	5	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Cigarmakers	12	5	.....	55	35	1	15	4	2,873	2,831	42	.....	.....	47,671 20	.....
Clerks, Retail	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Cloth Hat and Cap Makers	1	1	579	19	15	....	2	2	188	188	.....	.....	.....	13,353 00	2,487 00
Commercial Telegraphers	3	1	.....	.....	....	....	....	....	.....	.....	.....	.....	10%*e*	.....	300 00
Compressed Air Workers	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Coopers	8	5	.....	14	5	6	1	2	422	334	88	1 hr. day	35c per day	8,114 00	.....
Cutting Die and Cutter Makers	.....	.....	.....	3	2	....	1	....	170	160	10	2 hrs.p.wk.	10c per wk.	8,000 00	.....
Diamond Workers	.....	.....	.....	1	....	1	....	....	20	20	.....	.....	.....	9,420 00	.....
Electrical Workers	78	10	4,800	4	4	....	....	....	340	340	.....	.....	*t*	.....	12,000 00
Elevator Constructors	4	2	163	1	....	1	....	....	50	70	.....	1 hr.	40c per day	.....	.....
Engineers, Steam	46	20	3,500	23	9	2	9	3	116	89	12	.....	.....	3,243 00	.....
Firemen, Stationary	28	1	8,000	5	4	....	1	....	148	128	.....	.....	.....	1,240 00	1,000 00
Foundry Employees	2	.....	27	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	167 40
Freight Handlers, Railroad	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....

Garment Workers, United															
Garment Workers, Ladies	9	6		11	2	1	5	3	2,800			1 hr.			
Glass Bottle Blowers	2	2	150												5,442 25
Glass Workers, Amal	2	1	100												
Glove Workers	6	2	275	6	3	2	1		280	265					
Granite Cutters	5	2*f*		14	12		2		1,800	1,800			16c per day	27,367 00	5,860 00
Grinders, Pocket Knife Blade				1			1		36					3,378 27	41 50
Hatters															4,425 00
Hodcarriers	52	57		11	9	2			5,000						1,162 85
Horseshoers	11	5	200	4*k*	3		1		300	300		1 hr.	25to50c p.day	8,000 00	1,310 00
Hotel & Restaurant Employees	70	33	3,745	43	30	7	4	2	744	534	210		7%	12,710 73	19,236 02
Iron and Steel Workers	5	4													300 00
Jewelry Workers															
Lace Operatives				1	1				100					500 00	700 00
Lathers	11	13													
Laundry Workers	14	12	500	1				1	300					1,456 95	
Leather Workers on Horse Goods															1,000 00
Leather Workers, Amal		1													600 00
Lithographers	2		416												
Lithographic Press Feeders															
Longshoremen	33	19		4	4				800						
Machine Printers & Color Mixers															
Machinists	76	28	7,000		5	3	5		2,691				20c per day	527,104 00	
Maintenance of Way Employees	51	15											5%		
Marble Workers	4	1	100	9	6	1	1	1	2,065	1,100	965		35c per day	9,000 00	4,000 00
Meat Cutters and Butcher Workmen	9	8	800									2& 3 p. day	25c per day		3,000 00
Metal Polishers	11	16	1,000	30	20	5	4	1	800	800		½ hr.	15% per day	4,470 00	1,800 00
Metal Workers, Sheet	52	20		5	3		2		2,200	125			40c per day	23,565 00	5,000 00
Mine Workers, United	170	122	153,309		3		5		7,500	165,000			10%		
Miners, Western Federation of	23	20		6	2		2	2	3,000	500			*g*	108,126 95	10,156 11
Moulders	9	19					38		1,425					262,968 28	
Musicians	42	12	1,000	*h*									10%	5,000 00	5,000 00
Painters	93	85	33												
Papermakers	20	4	2,000	3	1		1	1	800		180	3hrs.p.dy.	*i*	17,000 00	
Patternmakers	4	1	500	11	6		4	1	238	238		1 hr.	*j* 10%	19,074 03	
Pavers and Rammermen															
Paving Cutters	14	6	200											532 00	800 00
Photo-Engravers	4		271	2			2		20					986 00	
Piano and Organ Workers															
Plate Printers	1		14												
Plasterers															
Plumbers	72	18		60	45	2	10	3						82,295 00	
Post-office Clerks	10	1	300												
Potters, Operative	3	2	46	1			1		14					2,714 98	

CHARTERS, MEMBERSHIP, STRIKES, ETC.—*Continued.*

Organizations.	Charters issued.	Charters surrendered.	Gain in membership.	Number of strikes.	Strikes won.	Strikes compromised.	Strikes pending.	Strikes lost.	Number involved.	Number benefited.	Number not benefited.	Reduction in hours per day.	Gain in wages.	Cost of strikes.	Donations to other unions.
Powder & High Explosive Workers	.....	2	.....	.....	....	....	....	....	.....	.....	.....	.....	*n*12½c. p. day	$ c. 70 00	$ c. .....
Print Cutters	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Printing Pressmen	28	11	1,000	11	5	3	1	2	650	400	.....	.....	25c. per day	41,000 00	.....
Pulp and Sulphite Workers	5	1	800	2	....	....	2	....	150	.....	.....	.....	5% day	500 00	1,000 00
Quarry Workers	10	3	1,000	11	8	2	1	....	800	800	.....	*l*	1 to 3c. p. hr.	11,724 50	385 45
Railroad Telegraphers	5	.....	3,000	.....	....	....	....	....	.....	.....	.....	.....	995,850*q*	.....	1,200 00
Railway Carmen	71	58	.....	3	....	....	3	....	.....	.....	.....	.....	.....	67,897 27	.....
Railway Clerks	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Railway Employees, Street	27	8	1,000	9	5	....	....	4	7,000	6,550	450	.....	½ to 5c. p. hr	80,264 94	13,378 80
Railway Express Messengers	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Roofers, Composition	3	3	50	2	1	....	....	1	72	36	36	1 hr	25c. per day	1,000 00	600 00
Sawsmiths	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Seamen	.....	1	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Shingle Weavers	3	2	.....	4	1	....	2	1	100	40	.....	.....	12% p. day	4,000 00	.....
Slate an Tile Roofers	1	2	150	2	2	....	....	....	.....	.....	.....	.....	12½c. p. hr	.....	.....
Slate Workers	.....	2	.....	3	2	....	....	1	400	1,000	.....	.....	.....	.....	.....
Spinners	1	.....	.....	6*m*	3	1	2	....	1,000	.....	.....	.....	10%	35,000 00	.....
Stage Employees, Theatrical	40	1	1,000	10	8	....	2	....	750	3,250	.....	.....	$1.00 p. day	25,000 00	.....
Steel Plate Transferrers	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Stereotypers and Electrotypers	3	1	90	6	....	....	....	6	21	.....	.....	.....	.....	5,400 80	.....
Stonecutters	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Stove Mounters	8	4	.....	2	....	2	....	....	94	.....	.....	.....	.....	4,110 38	25 00
Switchmen	15	4	316	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Tailors	26	8	.....	21	6	....	10	5	504	28	164	.....	5%	52,134 10	935 30
Teamsters	206	175	1,000	12	11	....	1	....	2,200	.....	.....	.....	35c.	20,000 00	.....
Textile Workers	50	10	2,000	12	9	1	1	1	1,000	.....	.....	.....	.....	16,000 00	.....
Tile Layers	12	1	216	3	2	1	....	....	.....	.....	.....	.....	*n*	.....	350 00
Tin Plate Workers	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	3% *o*	.....	.....
Tip Printers	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....

Tobacco Workers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3 to 5%	.....	300 00
Travellers' Goods and Leather Novelty Workers	2	1	175	5	2	....	3	....	428	380	4	8½&1hr.dy. 2 hrs. day.	10 % 25c	1,700 00	58 00 300 00
Tunnel and Subway Constructors	1	.....	140	.....	....	....	....	....	.....	.....	.....	.....	.....	69,330 79	15,819 08
*Typographical Union	16	23	3,518	12	5	....	6	1	161	67	38	.....	.....	.....	.....
Upholsterers	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	25 00
Weavers, Elastic Goring	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Weavers, American Wire	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	50 0
White Rats Actors	.....	.....	.....	.....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....
Totals	2,388	1,422	216,012	716	378	58	275	61	73,069	200,302	6,177			1,986,263 49	156,889 72

a Many benefited not involved in strikes; *b* 16 local, 28 branches; *c* 15 local, 28 branches: *d* 2 strikes, 2 lockouts; *e* for 1,000; *f* due to jobs being completed; *g* 14,000 men 25 cents per day, 7,000 50 cents per day secured without strike; *h* lockout involving 20,000 won by organization; *i* for 2,000 members; *j* for 100 members; *k* one lockout; *l* Saturday half-holiday for three branches; *m* including lockouts; *n* 40 cents for tile layers and 25 cents for helpers; *o* secured without strikes; *p* 56 involved in pending strikes; *q* aggregate for the year; *r* for 75; *s* for 50; *t* 850 received 50 cents per day increase; 3,700 received 25 cents per day; *u* for 48 members.

* For fiscal year ending May 31, 1912. † Including $2,462 refunded by local unions for benefits that were not distributed.

BENEFITS PAID TO MEMBERS BY INTERNATIONAL ORGANIZATIONS DURING THE PAST YEAR.

Organizations.	Death benefits	Death benefits members' wives.	Sick benefits.	Traveling benefits.	Tool insurance.	Unemployed benefits.
	$ c.	$ c	$ c.	$ c.	$ c.	$ c.
A. F. of L. locals	5,267 50		5,090 21	802 55	219 00	1,369 05
Asbestos Workers	500 00					
Bakers	3,226 40	800 00	29,169 45			
Barbers	24,750 00		46,311 77			
Boilermakers	2,100 00					
Bookbinders	5,475 00					
Boot and Shoe Workers	15,675 00		76,986 96			
Brick, Tile & Terra Cotta Workers	150 00					
Bridge and Structural Iron Workers	12,400 00					
Brushmakers				25 00		
Carpenters, Brotherhood.	258,074 30	36,225 00				
Carriage & Wagon Workers	1,050 00					
Carvers, Wood	2,850 00				141 75	
Cigarmakers	251,677 41		201,296 03	38,543 47		36,942 50
Cloth Hat ond Cap Makers			720 00			
Coopers	2,950 00					
Cutting Die & Cuttermkrs.	500 00					
Diamond Workers						1,068 00
Electrical Workers	8,250 00		8,000 00			
Firemen, Stationery	3,700 00	800 00	1,200 00			
Foundry Employes	400 00		390 00			
Glass Bottle Blowers	63,881 31					164,747 25
Glass Work'rs, Amalg'm'd	600 00					
Glove Workers	100 00					
Grinders, Pocket Knife Blade			36 00			
Hatters	49,889 25					
Hodcarriers	2,800 00					
Hotel and Rest. Emp.	26,450 00		34,345 75			
Iron and Steel Workers	4,150 00	600 00	8,955 00			
Lace Operatives	1,300 00	350 00				
Lathers		5,300 00				
Leather Workers on Horse Goods	1,400 00		2,125 00			
Leather Workers, Amal.						300 00
Machinists	56,231 25					
Maintenance of Way Employes	14,000 00					
Meat Cutters and But. Wk.	1,400 00		4,000 00			
Metal Polishers	3,150 00					
Metal Workers, Sheet	96,000 00					
Miners, Western Fed. of	27,069 47		115,277 32			
Moulders	61,900 00		152,456 20			10,971 80
Painters	99,525 00	12,375 00				
Papermakers	600 00					
Patternmakers	1,700 00		5,596 14		1,842 61	
Paving Cutters	2,200 00					
Photo-Engravers	1,885 00		6,265 17			
Plate Printers	1,381 75					
Plumbers	14,300 00		43,055 00			
Potters, Operative	5,975 00					
Printing Pressmen	16,700 00					
Quarry Workers	1,450 00					
Railroad Telegraphers	86,700 00					
Railway Employes, Street	125,453 45		18,708 66			
Roofers, Composition	2,300 00		1,500 00			

BENEFITS PAID TO MEMBERS BY INTERNATIONAL ORGANIZATIONS DURING THE PAST YEAR.—*Concluded.*

Organizations.—*Concluded*	Death benefits.	Death benefits members' wives.	Sick benefits.	Traveling benefits.	Tool insurance.	Unemployed benefits.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Shingle Weavers	.....	.....	2,636 00	.....	.....	.....
Slate and Tile Roofers	1,200 00	.....	.....	.....	.....	.....
Slate Workers	300 00	100 00	.....	.....	.....	.....
Spinners	1,000 00	.....	.....	.....	.....	.....
Stage Employes, Theatr'l.	10,000 00	.....	.....	.....	.....	.....
Stereotypers & Electrot'rs	4,900 00	.....	.....	.....	.....	.....
Stove Mounters	1,000 00	.....	.....	.....	.....	.....
Switchmen	168,957 50	.....	.....	.....	.....	.....
Tailors	12,765 59	.....	23,366 95	.....	.....	.....
Textile Workers	1,100 00	.....	.....	.....	.....	.....
Tobacco Workers	1,350 00	.....	5,114 00	.....	.....	.....
Travelers' Goods & Lea. Novelty Workers	125 00	.....	300 00	.....	.....	.....
Tunnel and Subway Con	1,800 00	.....	340 00	1,200 00	.....	.....
*Typographical Union	74,698 85	.....	.....	.....	.....	.....
Weavers, Elastic Goring	300 00	.....	.....	.....	.....	.....
Weavers, Amer. Wire	200 00	.....	614 00	.....	.....	.....
Totals	1,649,184 03	56,550 00	793,255 61	40,571 02	2,203 36	215,398 60

*(Fiscal year ending May 31, 1912.) Old-age pension, $176,319.67.

AVERAGE PAID UP MEMBERSHIP.

Year.	Membership.
1897	264,825
1898	278,016
1899	349,422
1900	548,321
1901	787,537
1902	1,024,399
1903	1,465,800
1904	1,676,200
1905	1,494,300
1906	1,454,200
1907	1,538,970
1908	1,586,885
1909	1,482,872
1910	1,562,112
1911	1,761,835
1912	1,770,145

THE LAWS RELATING TO LABOUR—CHRONOLOGY OF ONTARIO LABOUR LAWS.

Apprentices' and Minors' Act. Passed, 1871. Amended, 1874. Cap. 161, R.S.O. 1897, 1911.

Mechanics' and Wage-earners' Liens. Passed, 1873. Amended, 1874, 1878, 1882, 1884, 1887, 1890, 1896, 1897. Cap. 153, R.S.O., 1897. 1901, 1902, 1904. Consolidated and amended, 1910. Previous Act repealed.

Master and Servant Act. Passed, 1873. Amended, 1886. Cap. 157, R.S.O. 1897, 1901, 1904, 1908. Consolidated and amended 1910. Previous Act repealed.

Immigration Aid Societies Act. Passed, 1873. Cap. 212, R.S.O., 1897, 1904, repealed 1905.

Act to Facilitate the Adjustment of Disputes between Masters and Workmen. Passed, 1873. Cap. 159, R.S.O., 1897.

Act Respecting Innkeepers. Passed, 1874. Amended, 1882. Cap. 187, R.S.O., 1897, 1904, 1907.

Act Respecting Public Meetings, Cap. 230, R.S.O., 1897.

Act Respecting Threshing Machines. Passed, 1874. Cap. 265, R.S.O., 1897.

Act Respecting Co-operative Associations. Passed, 1880. Amended, 1884. Cap. 202, R.S.O., 1897, 1904, 1905, repealed 1907 (see Companies' Act).

Act Respecting Safety of Railway Employees. Passed, 1881. Cap. 207, R.S.O., 1897.

Act Respecting Accidents to Employees on Railways. Passed, 1881. Cap. 266, R.S.O., 1897.

Bureau of Industries. Established, 1882.

Act Respecting Pawnbrokers. Passed, 1884. Cap. 188, R.S.O., 1897, 1907. Consolidated, 1911. Old Act repealed.

Factories Act. Passed, 1884. Amended, 1887, 1889, 1895. Cap. 246, R.S.O., 1897. Further amended, 1901, 1902, 1903, 1904, 1905, 1908, 1911.

Act Respecting Wages. Passed, 1888. Cap. 156, R.S.O., 1897, 1899. Consolidated and amended 1910. Previous Act repealed.

Workmen's Compensation for Injuries Act. Passed, 1886. Amended, 1887, 1893, 1896, 1899. Cap. 160, R.S.O., 1897.

Lord's Day Observance Act. Passed, 1885. Cap. 246, R.S.O., 1897, 1903, 1904.

Shops Regulation Act. Passed, 1888. Amended, 1889-1897. Cap. 257, R.S.O., 1897. Further amended, 1900, 1901, 1903, 1904, 1908.

Egress from Public Buildings Act. Passed, 1888. Cap. 263, R.S.O., 1897.

Trades Disputes Act. Passed, 1890. Amended, 1894, 1897. Cap. 158, R.S.O., 1897. Further amended, 1902. Consolidated and amended, 1910. Previous Act repealed.

Woodmen's Lien Act. Passed, 1891. Amended, 1894, 1896, 1897, 1899. Cap. 154, R.S.O., 1897, 1903. Consolidated and amended, 1910. Previous Act repealed.

Act Respecting Stationary Engineers. Passed, 1891. Cap. 185, R.S.O., 1897, 1906, 1907, 1908, 1909. Consolidated and amended, 1911. Previous Act repealed.

Miners Act. Passed, 1892. Cap. 36, R.S.O., 1897, 1905, repealed, 1906.

Matters under Municipal Act. 1892, 1893, 1894, 1895, 1898. Cap. 223, R.S.O., 1897, 1904, 1905, 1906.

Insurance by Trade Unions. Passed, 1892. Amended, 1897. Cap. 203, R.S.O., 1897.

Act Respecting School for Artisans. Passed, 1892. Amended, 1895. Cap. 223, R.S.O., 1897.

Act Respecting Truancy and Compulsory School Attendance. R.S.O., Cap. 196, 1897. Amended, 1904. New revised Act repealing this, 1909.

Act Respecting Lien for Wages on Street Railways. Passed, 1895. Cap. 208, R.S.O., 1897, 1906. (See Railway Act.)

Labour on Public Works. Passed, 1896. Amended, 1897. Cap. 155, R.S.O., 1897, 1900. Consolidated and Amended, 1910. Previous Act repealed.

Act Respecting Liability of Directors' Companies for Wages. Passed, 1896. Sec. 85, Cap. 191, R.S.O., 1897. Repealed, 1907. (See Companies' Act.)

Act Respecting Liability of Mining Companies for Wages. Passed, 1896. Cap. 197, R.S.O., 1897, 1906. (See Mines Act.)

Act Respecting Technical Schools. Passed, 1897. Amended, 1911. Previous Act repealed.

Act Respecting Immigration of Children. Passed, 1897. Cap. 262, R.S.O., 1897.

Resolution Respecting Fair Wages on Public Works. Passed, 1900.

Act Creating Bureau of Labor. Passed, 1900. Revised, 1910. (See below.)

Act Respecting Mines. Passed, 1906, 1908, 1909, 1911, 1912.

Act Respecting Steam, Electric and Street Railways. Passed, 1906.

Act for Appointment of Railway and Municipal Board. (Trade Disputes provisions.) Passed, 1906. Amended, 1907.

Act Respecting Joint Stock and Other Companies. Passed, 1907, 1912.

Act Respecting the Manufacture and Sale of Bread. Passed, 1908.

Stenographic Reporters' Act. Consolidated, 1911. Old Act repealed.

Building Trades Protection Act. Passed, 1911.

Act Respecting Compulsory School Attendance of Adolescents, 1912.

An Act Respecting the Bureau of Labour.

S. O. 1910, Cap. 13. *Assented to 7th March,* 1910.

His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

1. This Act may be cited as the Bureau of Labour Act.

2. There shall be attached to the Department of the Commissioner of Public Works a bureau, to be styled "The Bureau of Labour."

3. The Lieutenant-Governor may appoint a Secretary of the said Bureau and may also appoint such other officers as may be necessary for the proper conduct of the Bureau.

4. It shall be the duty of the Bureau to collect, assort and systematize and publish information and statistics relating to employment, wages and hours of labour throughout the Province—co-operation, strikes, lock-outs or other labour difficulties, trades unions, labour organizations, the relations between labour and capital, and other subjects of interest to working men, with such information relating to the commercial, industrial, and sanitary condition of working men, and the permanent prosperity of the industries of the Province, as the Bureau may be able to gather.

5. Chapter 14 of the Acts passed in the sixty-third year of Her Late Majesty's reign is repealed.

LEGISLATION AFFECTING LABOUR.

ONTARIO.

Mining Regulations.

By an Act amending the Mining Act, employment in mines was regulated by a section prohibiting the employment of any boy under the age of fourteen years in or about a mine, and the employment of any boy under the age of seventeen years below ground in any mine. No woman is to be employed at mining work, except as a stenographer, bookkeeper or in a similar capacity. No person under the age of twenty years is to have charge of any hoisting machine by means of which persons are hoisted or lowered, nor is any person under eighteen to have charge of any hoisting machine or apparatus in a mine. Cases containing explosives must not be opened in the magazine, and only implements of wood, brass or copper are to be used in opening cases. Firing in sinking shafts or winzes is to be done by electric current. Explosives must not be used unless the package contains the name and place of business of the manufacturer, the strength, and the date of the manufacture. No boiler is to be installed in any building within 50 feet from the mouth of any shaft. The minimum depth of shafts for which provision must be made by suitable means of elevation by signals from the bottom of the shaft was changed from 100 to 50 feet. Various precautions against injuries from machinery were added. Aid to persons injured in mines was provided for by clauses calling for the keeping of properly constructed stretchers and articles for rendering first aid.

Hours on Street Railways.

The Ontario Railway and Municipal Board was given power to regulate the hours during which conductors and motormen employed by a street railway company may be required or permitted to work. No such employee is permitted to work more than six days in a week or ten hours per day, and wherever practicable or reasonable such ten hours' work must be performed within twelve consecutive hours.

Compulsory School Attendance.

An Act was passed respecting the compulsory school attendance of persons between fourteen and seventeen years of age. Where a bye-law passed under this Act is in force, every person who has in his employment any adolescent to whom the bye-law applies shall give notice to the Board of such employment, and shall state the hours thereof.

ALBERTA.

Boiler Inspection.

By an Act which takes the place of the Steam Boilers' Act of 1906 authorization was given to the Resident Governor to appoint a Chief Inspector of Boilers and other inspectors for the carrying out of the provisions of the Act, such inspectors to keep a complete record of all boilers inspected and all repairs ordered by them, and of all accidents in connection with boilers in their districts. The qualifications of the inspectors to be appointed included five years' experience as a practi-

cal machinist or boiler maker, the holding of an Alberta first-class engineer's certificate and disinterestedness in the sale of boilers or steam machinery. Their duties included internal and external inspection of every boiler in the Province at least once a year, also the inspection of any boiler which may have been reported to them as unsafe with a notification to the owner of the necessity of repairs. Stringent regulations in regard to the manufacture of boilers were provided by the Act, by which every manufacturer before commencing on a boiler to be built under the regulations should submit to the Department of Public Works of the Province of Alberta complete workshop drawings of the proposed boiler, together with complete specifications; also accessories were to be submitted for approval in the same way. A copy of approved specifications of any new boiler shipped into the Province was to be sent to the purchaser for the use of the inspector at his initial inspection. No second-hand boiler was to be brought into the Province for operation as a boiler unless a certificate was granted stating that such boiler had been equipped according to the regulations. Certificates were to be granted by the inspectors after the boilers, upon inspection, had been found to be in safe working order as required by the regulations, a certificate to continue in force until the inspection of the boiler in the following year. Explosions in boilers were to be reported by the owners within twenty-four hours of the occurrence of the same, together with the number of persons killed or injured, and the probable cause of the explosion. No removal of the parts of the boiler was to be made until after examination by the inspector. No person may operate any steam boiler unless he holds a certificate of qualification as an engineer; an exception, however, is made when the owner of a steam boiler can show that by reason of some unforeseen occurrence, he cannot immediately secure the services of a person of such qualifications, when a permit may be granted to a person with satisfactory references to operate the boiler for a period of thirty days. The classification of certificates granted to applicants was clearly defined under the Act. A candidate for a first-class certificate, which permits a man to take charge of and operate any steam plant, must be at least twenty-five years of age, and must furnish proof that he has been employed as a machinist or boiler maker on the repairing or building of steam engines or boilers for a period of not less than twenty-four months, and has had charge of a steam plant with which was connected a battery of boilers aggregating not less than 300 h.p. in capacity, and that he has operated engines aggregating not less than 300 h.p. capacity for a period of at least twelve months. The qualifications for securing second and third class certificates, also traction engineer's final certificates, provisional certificates and final firemen's certificates, were also clearly defined by the Act.

Protection of Children.

An Act was passed amending the statute law of the Province by which important amendments were made to several Acts previously existing. An addition was made to the Children's Protection Act of 1909 whereby authority was granted to municipal councils in cities, towns and incorporated villages to pass by-laws regulating and controlling and licensing children engaged as express or despatch messengers, sellers of newspapers and smallwares, and bootblacks. No license fee was to exceed the sum of fifty cents per year, and no child engaged in two or more of the above occupations was to be compelled to take out more than one license. No license of that kind was to be granted to any girl nor to any boy under the age of twelve, and only to such boys between twelve and fourteen who presented written authority from parents or guardians authorizing them to make application for

such license. No licensee was to be permitted to engage in any occupation for which he is licensed after the hour of 8 p.m. during December, January and February, and 9 p.m. during the remaining months of the year or during school hours.

Early Closing.

Authority was given by an Early Closing Act, assented to on February 16th, to the council of any city or town with the population of 1,000 residents or more to fix the hours at and after which all shops of any specified class are to be closed for serving customers, such hour not to be earlier than 6 o'clock in the afternoon on any day of the week, except on one specified day when such closing hour may be not earlier than 12 o'clock noon. A closing by-law may prohibit the carrying on of any retail trade after the closing hour in any place not being a shop within the area of the city or town to which such by-law applies, if it would be unlawful to keep a shop open at such time. If several trades or business are carried on in the same shop, and if the closing by-law does not apply to one or more of such trades or business, such shop may be kept open after the closing hour for the purpose of this trade and business only.

Master and Servant.

Important amendments were made to the Act which was passed in 1904 respecting masters and servants. The section relating to non-payment of wages, ill-usage or improper dismissal by an employer, previously provided that in the case of improper dismissal the employer might be directed to pay any servant thus dismissed such further amount, in addition to that due, as might seem reasonable to the magistrate before whom the case was tried, such payment not to exceed four weeks' wages at the rate at which the servant was being paid at the time of his dismissal. In its amended form the Act provided for payment of this sum or a sum equal to the wages which would have been earned by the dismissed employee between the date of his dismissal and the date of the determination of the matter by the magistrate, the dismissed employee to have the benefit of receiving the greater amount under these alternatives. Provision was made for payment of wages due and also of a sum which the dismissed employee might have earned between the time of his dismissal and the determination of the matter by a justice in the case of a dismissal for a good and sufficient cause. Further powers were given by the 1912 legislation to the justice before whom the action for wrongful dismissal was tried. Formerly he was required to transmit any information regarding a counter-claim on the part of the employer to the clerk of the Supreme Court of the District. By the amended form of the Act, he was empowered to direct the payment of the reasonable amount to the plaintiff after deducting such sum as he was of opinion that the employer was entitled to by reason of a counter-claim. These provisions were not to affect in any way the right of the employer or his administrators to any such remedy he or they might be entitled to against the dismissed servant by reason of such counter-claim.

MANITOBA.

Protection of Workmen.

Important legislation providing for precautionary measures in the erection of buildings was passed on March the 26th, when the Building Trades Protection Act was given Royal Assent and came into force. Provision was made for the use of

no scaffolding, hoists, ladders or mechanical temporary contrivances which were unsafe or which were not constructed and placed so as to afford reasonable safety for persons employed in the erection, alteration, repair or demolition of any building. Regulations were made in the case of such operations that the floors of all scaffolding, whether standing or suspended from overhead should be at least four feet wide, and there should be a railing or guard not less than three feet and not more than four feet on the outside of the scaffolding for the protection of persons working thereon. Scaffolding suspended from an overhead support must be secured firmly, so that there is no possibility of its swaying to and fro. Poles used in scaffolding must be securely lashed at every point of contact, and square timber thus used must be securely spiked or bolted at such places. Hoisting lumber or timber in a single sling was prohibited by this law. Provision was made in cases where hoists are used for raising materials for use in buildings for the protection of the shafts or openings at each floor by a barrier not less than three feet nor more than four feet from the level of the floor, and the barrier must be placed not less than two feet from the edge of the shaft in which the hoist is operated. Ladders used in the construction, etc., of buildings must extend at least four feet above any scaffolding, staging or flooring. In the case of steel frame buildings provision was made for the construction of staging for riveters, so as to secure the reasonable safety of such employees, and the Act calls for the provision of a temporary floor on the girders and floor beams immediately below the portion of the floor upon which the riveters are working sufficient for the protection of the workmen engaged below that floor. Protection of persons using a street or sidewalk upon which building construction was being carried on was provided for by a clause necessitating the erection of a covered passageway wherever any work above the footway is being done. Drains, etc., must not be obstructed, and the roofs of all covered ways kept clear from any material whatever.

Steam Engineers.

Important amendments were made to the Steam Engineers Act which was passed in 1910, and which provided for the incorporation and licensing of steam stationary engineers in Manitoba. A clause in the Act of 1910 provided for the appointment of the Manitoba Association of Stationary Engineers by a Board of Directors who should be elected by the members of such Association. This clause was added to by a provision that such directors must be the holders of first-class certificates issued under the provisions of the Act. A further amendment, however, was made later in the session, which provided that one of the Board of Directors, may be a member holding a second or third class certificate. The two years minimum, during which engineers holding or having charge of steam plants were granted exemption from examination were specifically defined by the statement that they must be prior to the 16th of March, 1910. The age limit of persons making application for a certificate and the granting of the same was fixed at eighteen years; that is to say, any person over that age could apply for a certificate and, upon payment of the fees of the Association, be granted the same. The previous provision of this Act was to the effect that any person could apply, the change reducing the number of persons qualified through the age requirements. Another amendment to this Act necessitated the attaching to a certificate of qualification granted under the Act the names of at least two of the examiners appointed. The 1910 form of the Act was added to by a provision empowering the Resident Governor, on the recommendation of the Board of Directors, to cancel the appointment of any examiners

previously appointed under the Act. Power was also given to the directors to assess all members $1.00 a year if it was found necessary at any time. Authorization was given the Board of Examiners to issue in special cases a special certificate at their discretion. In order to facilitate the examination of candidates living in outlying parts of the Province, the examiners were permitted to forward examination papers to a Justice of the Peace or other responsible person who should oversee such applicant writing for his certificate.

Threshers' Liens.

The section relating to wages in the Threshers' Lien Act of the Revised Statutes of 1902 and subsequent amendments provided that every person having any threshing done for him should be liable for the wages due to every employee working on threshing, provided such employee gave notice within a certain time stating the amount due to him for the time occupied in such threshing. An addition to this section was made in the 1912 Legislature to the effect that any payments of such wages by the person so notified should, if the same were properly due and owing at the time of payment, be credited by the thresher in reduction of his claim against such person. The thresher was not to be entitled to commence an action for the amount of his claim against the person for whom the threshing had been done within the stipulated period without first producing to such person evidence that there was no such unpaid claim for wages or offering to deduct from his account the amount of any such unpaid claim or claims.

For Encouragement of Industry.

A body under the name of the Winnipeg Industrial Bureau was incorporated by an Act which received the Royal Assent on April 6th, authorizing the said Bureau to conduct investigations into all matters relating to industries of the City of Winnipeg, with a view to the development and improvement of the same and to publish and distribute the results of such investigation. The Bureau was further authorized to promote legislation in any way likely to further its purposes and to encourage and aid in the establishment of manufacturing industries in the City of Winnipeg.

NEW BRUNSWICK.

Workmen's Compensation.

Important amendments were made to the Workmen's Compensation Act of 1903. The section defining workmen was altered to include among occupations coming within the scope of the Compensation Act those of granite workers and stone cutters, who were previously reckoned among the classes of employees outside of its applicability. In the case of the death of a workman, provision was made for a sum equal to his earnings during the three years preceding the injury, the amount not to exceed $2,000. Under the former provision of the Act such maximum was fixed at $1,500. Maximum payment in the case of total or partial incapacity resulting from injury was not to exceed seventy-five per cent. of the average weekly earnings, the former provision being for a sum not exceeding fifty per cent. Under the provisions of the Act of 1903 an action for the recovery of compensation for an injury was not maintainable against the employer of the workman unless notice of the injury was given within twelve weeks, and unless the

action was commenced within six months from the occurrence of the accident causing the injury or in case of death, within twelve months of the time of death. By an amendment made in 1908, the time in which notice of injury was to be given was reduced to two weeks, and a further alteration was made during the session under review by which the time was fixed at two months. The previous legislation provided that if the incapacity lasted less than two weeks, no compensation should be payable in respect of the first week, and if the incapacity lasted for more than one hundred weeks, compensation should be payable in respect of the first hundred weeks only. The latter part of this provision was changed by an amendment which provided that if the incapacity lasted for more than one hundred weeks and was due to total blindness in both eyes, the loss of an arm or leg, the total disability of a limb, or the loss of a hand or foot, compensation should be in respect of such incapacity for a period not exceeding two weeks.

Child Labour.

During the session of 1905 the Factories Act was passed prohibiting the employment of any person under the age of fourteen years in any factory, except in special cases authorized in writing by the Inspector. The clause concerning the employment of child labour in manufacturing establishments was strengthened by an amendment passed during the session under review making a special prohibition directed against employers, and also defining the procedure to be followed by factory inspectors. Authorization was given to the factory inspector to demand of any employer the names of all children under sixteen years of age in his employ with the production of birth record, age certificate, etc., of such children, failure to produce which would be considered evidence that the child was illegally employed. Violation of the provision of this section was punishable both in the case of a parent and employer of the child illegally employed.

Early Closing.

In the Early Closing Act of the 1911 session, the Council of any city or town was authorized to require by a by-law that during the whole or any part of the year all shops within the city or town should be closed between six o'clock in the afternoon of one day and five o'clock in the morning of the next with the exception of Saturday. A clause was also inserted providing that where two or more branches of trade were combined in one shop, the principal one should be considered as prevailing for the enforcement of any by-law. The amendment during the session under review allowed discrimination between classes of business and between the same kinds of business in different parts of the city or town.

Town Planning.

An Act was passed relating to town planning.

Plumbing Inspectors.

The Public Health Act was amended by an addition which provided for such person as was appointed as inspector of plumbing being a city or town engineer or a practical plumber. No such specification of qualification was included in the previous form of the section relating to this matter.

NOVA SCOTIA.

The first session of the thirty-fifth General Assembly was convened in the Province of Nova Scotia on February 22nd, and prorogued in May of the same year. Seventy-six public statutes were enacted, 104 public Acts and sixty-three private ones were also passed. The most important feature of the 1912 legislation from the standpoint of labour was the amendments made to the Workmen's Compensation Act of 1910. Amendments were also made to the Factories' Act, the Coal Mines Regulation Act, and the Act relating to Miners' Relief Societies. Agriculture was affected by an Act consolidating the previous Acts for the encouragement of that industry. Legislation was enacted authorizing the expenditure of a Dominion Subsidy which was provided for in the Canadian statutes of 1912. Acts were also passed in reference to town planning and tenement houses. The following is a brief review of the most important legislation affecting labour which was enacted during the 1912 session.

Workmen's Compensation.

Several amendments were made to the different clauses of the Workmen's Compensation Act. The first amendment concerns the applicability of the provisions of the 1910 Act in regard to the persons coming within its scope. Previously, the sub-section denoting the application and definition of the Act stated that it should apply only to employment by the undertakers defined where not less than ten workmen were employed in or about a railway, factory, mine, quarry or engineering work, loading or unloading a vessel or in or about any building being constructed or repaired or demolished. By the amendment of 1912 this sub-section was changed, so that now the Act can be invoked where as few as five persons are employed, the previous number of ten not being necessary for the application of the legislation. A workman was defined by the Act as including every person engaged in any employment to which it applied whether by way of manual labour or otherwise, but no provision was made for a person whose remuneration exceeds $1,000 per year. Provision was also precluded in the case of persons whose employment was of a casual nature and in the case of persons who were employed otherwise than for the purposes of the employer's trade or business. An amendment to the section containing this provision precludes such persons whose employment is both of a casual nature and for other purposes than those of the employer's trade. Section 10 of the 1910 statute provided that where any employer became liable under the Act to pay compensation in respect of any accident and was entitled to any sum from insurers in respect of the amount due to a workman under such liability, then in the event of the employer becoming bankrupt or making compromise or any arrangement with his creditors, or if the employer was a member of the Company having commenced to be wound up, such workman should have a first charge upon the sum aforesaid for the amount due. An amendment to this section provided that if the employer was a company, in the event of the company having commenced winding up proceedings the workman should have a first charge upon the amount due. The first schedule of the Act provides in its amended form that where total or partial incapacity for work resulted from an injury, the compensation shall be a weekly payment during the incapacity after the first week, and not exceeding fifty per cent. of his average weekly earnings during the previous twelve months, if he has been so long employed. The previous form of this schedule provided that the minimum amount payable in the case of compensation for injury should be $500.

Child Labour.

In the Factories Act of 1901 it was provided that no child should be employed in any factory except during the months of July, August, September and October, and only then in cases where the gathering or preparation of fruit or vegetables for canning purposes is being carried on. By the amendment of this Act during the session under review it was provided that every employer should, before permitting a person under the age of sixteen years to work in a factory; obtain a certificate of birth from such person or an affidavit proving age, which affidavit was to be sworn before a Justice of the Peace or some other authority qualified to administer an oath by someone who knew the age of the employee. The certificate was to be kept at the factory and to be produced upon a demand by the inspector at any time. The schedule to the previous Act was added to by forms of birth certificates, etc.

Juvenile Offenders.

An Act was passed consolidating and amending the law relating to juvenile offenders and the protection of children.

Mining.

The statute previously existing, which made provision for the relief of a widow, children or dependent relatives in the case of the decease of a workman who at the time of his death was entitled to participation in the benefits of any relief society, was changed by the substitution of a section providing for the payment of a sum from the Provincial Treasury to any person or persons entitled thereto regardless of the fact of their being relatives or dependents of the deceased. The payments out of the Provincial Treasury provided by this section may be made on application to any society or fund to which the deceased workman belonged, provided the proper certificate showing the different amounts paid by the society to the person or persons entitled thereto is furnished to the Government at the end of the year. No society or fund is recognized under this Act, unless its constitution and by-laws are approved by the Governor-in-Council.

An amendment was made to the Mines Act of 1911, by which the royalty on coal was fixed at ten cents per ton, the previous amount having been twelve and a half cents. Previously, coal used for domestic purposes by the workmen employed in and about the mine and also coal used in mining operations in the mine from which such coal was procured, was not liable to royalty. Under the amended form of the Act the quantity of coal so exempted from payment of royalty in each quarter of the year was fixed at ten per cent. of the total quantity of coal removed from the mine during such period.

An addition was made to section 9 of the Coal Mines' Regulation Act, 1907, whereby provision was made for examinations for certificates of competency for managers, underground managers and over-men, to be held annually. A section was added which provided for a Board consisting of the inspector of mines, two men experienced in coal mining holding manager's certificate of competency, and one mechanical engineer holding a first-class certificate of competency for the purpose of preparing questions for examination of candidates for certificates of competency to managers, underground managers and over-men. The inclusion of this section has the effect of preventing any member of such Board of Examiners

from being appointed on the Board to examine papers written by the candidates at the annual examination provided for by the 1912 legislature. The Examining Board now consists of three managers of mines (instead of as previously the Inspector of Mines and two managers of mines), also two experienced miners actually engaged in coal mining in the Province. The previous form of the statute called for the inclusion of three experienced miners without specifying that such miners should be actually engaged in coal mining. As in the previous legislation two persons were to be appointed on the Board by the Commissioner, but further provision was made for one of them being a mechanical engineer holding a first-class certificate of competency. Two mechanical engineers holding first-class certificates of competency are now to be included in the Board in place of such Deputy Inspectors, who received directions from the Inspector to act as members of the Board. The means which have been taken to prevent explosion in mines were given further attention in the 1913 legislation. Previous legislation prohibited the use of a safety lamp in any place where there was likely to be an accumulation of explosive gas, except at a lighting station. A more stringent rule was laid down by the legislation of the section under review, which allows only a shot-firer, employed in the mine as a shot-firer, to have in his possession any key or contrivance for opening the lock of any safety lamp or any lucifer match or apparatus of any kind for striking a light.

Town Planning.

An Act was passed giving cities, towns or municipalities powers to carry out a town planning scheme.

QUEBEC.

Female and Child Labour.

An Act was passed to regulate the hours of employment of boys under eighteen years of age and of women and girls working in cotton or woollen factories, enacting that persons of this description shall not be employed for more than ten hours in any one day or more than fifty-five hours in any one week.

SASKATCHEWAN.

Protection of Workmen.

Legislation very much along the lines of the Manitoba Building Trades Protection Act was passed in Saskatchewan when the Building Trades Protection Act of the latter Province received the Royal Assent on March 15th. The prohibition of the use of scaffolding, hoists, ladders, etc., or mechanical temporary contrivances of an unsafe nature was made in connection with the erection, alteration, or repair of any building. A section of the Act provided for the observance of regulations in the erection, alteration, repair, improvement or demolition of such building more than two stories in height. In the case of skeleton steel frame buildings, compliance with the regulations provided for by the Act necessitates the construction of a temporary floor of two-inch plank as soon as the steel frame has reached the first column splice above first floor level, such floor to be removed when the erection reaches a point level with the next column splice, and so on up to the top of the building, when a double floor of planking must be laid down immediately under any

derrick for a sufficient space above the derrick to protect workmen on the floors below that on which the derrick is working, and to hold with safety the materials hoisted by the derrick. The Act calls for the provision of staging for riveters working on such floors in order that a reasonable amount of safety may be secured for such workmen. As in the Manitoba Act of the same nature during the 1912 session, provision is made for the protection of persons using a street or sidewalk upon which building construction is being carried on by a clause necessitating the construction of a covered passageway not less than eight feet high wherever any work above the footway was being done. The obstruction of drains is also prohibited, as in the Manitoba legislation.

Female Labour.

An Act was passed prohibiting the employment of any white woman or girl in any place of business or amusement owned, kept, or managed by any Japanese, Chinaman, or other Oriental person. Prohibition was also made by the same Act of the presence of any white woman in a place of such description, except in the capacity of a customer. This Act went into force May 1st, 1912.

LIST OF LABOUR BUREAUS AND WHEN ORGANIZED.

During the past forty years labour's interests have become so important a factor with representative Governments throughout the world that they deemed it necessary to create Labour Bureaus for the purpose of collecting accurate statistics of the progress of a nation's prosperity arising from commercial, mechanical and agricultural pursuits. The success of these undertakings has proved most satisfactory, as is shown by the following list of Labour Bureaus compiled from official records:—

Ontario.—The Bureau of Labour was created by an Act passed by the Ontario Legislature, April 25th, 1900, and amended in 1910. The Department is under the direction of Hon. J. O. Reaume, Minister of Public Works. Secretary of the Labour Bureau, Robert Edgar, Toronto, Ont.

Saskatchewan.—Secretary Bureau of Labour, Thos. M. Molloy, Regina, Sask.

Canada.—The Department of Labour was established in July, 1900, and practically supersedes the Bureau of Labour of the Department of Agriculture, established in 1890, with Mr. George Johnson as chief clerk. The Department is now a separate portfolio, with Hon. T. W. Crothers as Minister. The Act establishing the Department provides for the monthly issuing of a Labour Gazette, the editor of which is F. A. Acland, Deputy Minister of Labour. The first number of the Gazette was issued in September, 1900.

Great Britain.—The Labour Bureau of the Board of Trade was established March 2nd, 1886. In 1893 the service was greatly enlarged, and given its present name, "Board of Trade Labour Department." A. Wilson Fox, Chief Secretary. It publishes monthly The Labour Gazette; also annual reports.

New Zealand Department of Labour.—The Right Hon. J. A. Millar, Minister of Labour. E. Tregear, Secretary, Wellington, N.Z.

New South Wales.—Department of Labour and Industry. T. B. Clegg, Chief Clerk, Sydney, N.S.W.

Queensland.—Department of Immigration.—Government Labour Bureau and Relief. Chief Clerk, Brisbane, Queensland.

South Australia Labour Bureau.—Chief Clerk, A. C. H. Richardson, Adelaide, South Australia.

West Australia.—Government Statistician, Malcolm A. C. Fraser, Perth, West Australia.

United States Department of Labour.—Established as a Bureau of Labour, January 31st, 1885; made a Department of Labour, June 13th, 1888. Bi-monthly bulletins. Annual reports. Commissioner of Labour, Chas. P. Neill, Washington, D.C.

United States Census Office.—E. Dana Durand, Director of Census, Washington, D.C.

Massachusetts Bureau of Statistics of Labour.—Established June 23rd, 1869. Quarterly bulletins. Annual reports. Chief of the Bureau of Statistics of Labour. Ch. F. Gettemy, Boston, Mass.

Pennsylvania Bureau of Industrial Statistics.—Established April 12th, 1872. Annual reports. Chief of Bureau of Industrial Statistics, John L. Rockey, Harrisburg, Pa.

Connecticut Bureau of Labour Statistics.—Established July 12th, 1873. Abolished July 23rd, 1875. Re-established April 23rd, 1885. Annual reports. Commissioner of Labour, Patrick H. Connolly, Hartford, Conn.

Kentucky Bureau of Agriculture, Labour and Statistics.—First established March 20th, 1876, as a Bureau of Agriculture, Horticulture, and Statistics; the duties of the Bureau were enlarged and the present name adopted April 2nd, 1892. Biennial reports. Commissioner of Agriculture, Labour and Statistics, J. W. Newman, Frankfort, Ky.

Missouri Bureau of Labour, Statistics and Inspection.—Established March 19th, 1879; enlarged March 23rd, 1883. Annual report. Commissioner of Labour, A. W. Biggs, Jefferson City, Mo.

Ohio Bureau of Labour Statistics.—Established May, 1887. Annual reports. Commissioner of Labour, C. H. Wirmel, Columbus, Ohio.

New Jersey Bureau of Statistics of Labour and Industries.—Established March 27th, 1878. Annual reports. Chief of the Bureau of Statistics of Labour and Industries, W. C. Garrison, Trenton, N.J.

Illinois Bureau of Labour Statistics.—Established May 29th, 1879. Biennial reports. Secretary of the Bureau of Labour Statistics, David Ross, Springfield, Illinois.

Indiana Bureau of Statistics.—Established March 29th, 1879. Biennial reports. Chief of the Bureau of Statistics, J. J. Walsh, Indianapolis, Ind.

New York Bureau of Labour Statistics.—Established May 4th, 1883; created a Department of Labour, 1902. Commissioner of Labour, John Williams, Albany, N.Y. Quarterly bulletins. Annual reports.

California Bureau of Labour Statistics.—Established March 3rd, 1883. Biennial reports. Commissioner of Labour, J. P. McLaughlin, San Francisco, Cal.

Michigan Bureau of Labour and Industrial Statistics.—Established June 6th, 1883. Annual reports. Commissioner of Labour, G. F. Powers, Lansing, Mich.

Wisconsin Bureau of Labour Statistics.—Established April 3rd, 1883. Biennial reports. Commissioner of Labour, J. D. Beck, Madison, Wis.

Iowa Bureau of Labour Statistics.—Established April 3rd, 1884. Biennial reports. Commissioner of Labour, E. W. VanDuyn, Des Moines, Iowa.

Maryland Bureau of Industries of Statistics.—Established March 27th, 1884. Annual reports. Chief of the Bureau of Industries Statistics, Chas. J. Fox, Baltimore, Md.

Kansas Bureau of Labour Statistics.—Established March 5th, 1885. Annual reports. Commissioner of Labour, Owen Doyle, Topeka, Kan.

Rhode Island Bureau of Labour Statistics.—Established March 29th, 1887. Annual reports. Commissioner of Labour, Geo. H. Webb, Providence, R.I.

Nebraska Bureau of Labour and Industrial Statistics.—Established March 31st, 1887. Biennial reports. The Governor, *ex-officio* Commissioner. Deputy Commissioner of Labour and Industrial Statistics, Louis V. Guye, Lincoln, Neb.

North Carolina Bureau of Labour Statistics.—Established February, 28th, 1887. Annual reports. Commissioner of Labour, M. L. Shipman, Raleigh, N.C.

Maine Bureau of Labour Statistics.—Established March 7th, 1887. Annual reports. Commissioner of Labour, J. F. Connelly, Augusta, Me.

Minnesota Bureau of Labour.—Established as a Bureau of Labour Statistics, March 8th, 1887; enlarged and changed to the Bureau of Labour, April, 1893. Biennial reports. Commissioner of Labour, W. F. Houk, St. Paul, Minn.

Oklahoma Department of Labour.—Established September, 1907. Commissioner of Labour, Charles L. Daugherty, Guthrie, Okla.

Colorado Bureau of Labour Statistics.—Established March 24th, 1887. Biennial reports. Commissioner of Labour, E. V. Brake, Denver, Col.

West Virginia Bureau of Labour.—Established February 22nd, 1889. Annual reports. Commissioner of Labour, I. V. Barton, Wheeling, W. Va.

North Dakota Department of Agriculture and Labour.—Established October 1st, 1890. Biennial reports. Commissioner of Labour, W. C. Gilbreath, Bismark, N.D.

Montana Bureau of Agriculture, Labour and Industry.—Established February 17th, 1893. Annual reports. Commissioner of Labour, J. H. Hall, Helena, Mont.

New Hampshire Bureau of Labour.—Established March 30th, 1893. Biennial report. Commissioner of Labour, J. E. D. Davie, Concord, N.H.

Washington Bureau of Labour.—Established June 11th, 1897. Annual reports. Commissioner of Labour, C. F. Hubbard, Olympia, Wash.

Idaho Bureau of Labour and Mining Statistics.—Established March 11th, 1895. Annual reports. Commissioner of Labour, Jos. P. Fallon, Boise City, Idaho.

Virginia Bureau of Labour and Industrial Statistics.—Established March 3rd, 1898. Annual report. Commissioner of Labour, James B. Doherty, Richmond, Va.

Louisiana Bureau of Statistics of Labour.—Established July 9th, 1900. Biennial reports. Commissioner of Labour, Jas. Byrnes, New Orleans, La.

Oregon Bureau of Labour Statistics and Inspection of Factories and Workshops.—Established June 3rd, 1903. Biennial reports. Commissioner of Labour and Inspector of Factories and Workshops, O. P. Hoff, Salem, Ore.

Tennessee Bureau of Labour, Mines and Mineral Department.—Established 1891. Commissioner of Labour, R. A. Shiflett, Nashville, Tenn.

South Carolina Department of Agriculture, Commerce, and Industry.—Re-organized 1909. Commissioner, E. J. Watson, Columbia, S.C.

Porto Rico Bureau of Labour.—Established 1912. Chief J. C. Bills, Jr., San Juan, Porto Rico.

Argentine Republic.—Francoise Latzina, Director General de la Statisque de la Republique Argentina (Ministere de l'Interieur), Buenos Ayres.

Austria-Hungary.—Commission Central of Statistics (Minister of Public Instruction). Dr. Karl Theodor von Inama Sternegg, President, Vienna. Department of Municipal Statistics, Dr. Sedlatzek, Chief, Vienna.

Bavaria.—Royal Bureau of Statistics (Department of Interior). Karl Rasp, Director, Munich.

Belgium.—Royal Bureau of General Statistics (Minister of the Department of the Interior and Public Instruction). Edmund Nicoali, Chief, Brussels.

Brazil.—Dr. R. Pompeia, Director de Bureau de Statistique des Estats Unis du Bresil (Ministere de l'Interieur), Rio Janeiro.

Bulgaria.—Bureau of Statistics of Bulgaria (Minister of Public Instruction). F. Ivanchoff, Director, Sophia.

Chili.—Don Francisco S. Asta Burnaga, Chef du Bureau Central de Statistique de Chili, Santiago.

Denmark.—Royal Bureau of Statistics (Minister of Finance). Marius de Gad, Director, Copenhagen.

France.—Office du Travail (Ministere du Commerce et de l'Industrie). C. Moron, Directeur, Paris.

Victor Furquan, Chef du Bureau de la Statistique General de France (Ministere du Commerce et de l'Industrie).—Office du Travail, Paris.

Germany.—Imperial Office of Statistics (Department of Interior). Dr. F. W. Hans Von Schell, Director, Berlin.

Herzegovina.—Bureau of Statistics of Bosnia and Herzegovina. Dr. Ferdinald Schmidt, Director, Sarajevo.

Holland.—Herr Methour, Director of Netherlands Statistical Central Office, La Haye, Netherlands.

Italy.—Directeur General de la Statistique du Royaume, G. Montemartini, Director dell' Offices del Lavoro (Ministere de l'Agriculture, de l'Industrie, et du Commerce), Rome.

Japan.—N. Hanausa, Chef du Bureau General de la Statistique (Cabinet Imperial), Tokio.

Mexico.—Antonio Penafiel, Directeur General de la Statistique de la Republique (Mexicaine du Fomento), Mexico.

Paraguay.—I. Jasquet, Director General de la Statistique du Paraguay, Assumption.

Portugal.—Ernesto Madeira Pinto, Director General of Statistics of Commerce (Minister of Public Works, Commerce and Industries), Lisbon.

Prussia.—Royal Bureau of Statistics (Minister of the Department of the Interior). Karl Julius Emil Blenck, Director, Berlin.

Office of the Statistics of the City of Berlin. Dr. Richard Bockh, Director, Berlin.

Roumania.—C. E. Cupenski, Director de la Statistique General du Royaume (Minister de l'Agriculture, de l'Industrie, du Commerce, et des Domaines), Bucharest.

Russia.—Bureau, Directeur du Comite Central de Statistique (Ministere de l'Interieur), St. Petersburg.

B. Grigoreff, Chef du Bureau de la Statistique Municipale, Moscow.

Saxony.—Bureau of Statistics of the Minister of State. Dr. Victor Bohmert, Director, Dresden.

Spain.—Ing. Francisco de Paulo de Arrillaga, Director General of the Geographic Institute and Bureau of Statistics of Spain, Madrid.

Styria.—Bureau of Statistics of Styria. Dr. Ernest Michler, Director, Gratz.

Sweden.—Dr. Elis Sidenbaldh, Director en Chef du Bureau Central de Statistique de Royaume (Minister de l'Interieur), Stockholm.

Norway.—Anders Nicolaikiser, Directeur du Bureau Central de Statistique du Royaume (Ministere de l'Interieur), Christiana.

Switzerland.—Dr. Louis Guillaume, Directeur du Bureau Federal de Statistique (Ministere de l'Interieur), Berne.

Stephen Bauer, Office International du Travail, Basle, Switzerland.

Uruguay.—Honore Roustan, Director du Bureau de la Statistique General, Montevideo.

LIST OF NATIONAL AND INTERNATIONAL LABOUR ORGANIZATIONS.

With Names and Addresses of General Secretaries, Having Subordinate Organizations in the Province of Ontario.

Trades and Labour Congress of Canada, P. M. Draper, Box 1017, Ottawa, Ont.

American Federation of Labour, Frank Morrison, 801-9 G. Street, N.W., Washington, D.C.

Actors' National Protective Union, W. W. Waters, 1553 Broadway, New York, N.Y.

Allied Metal Mechanics' International Association, John E. Devlin, 421 Valentine Building, Toledo, Ohio.

Asbestos Workers of America, T. J. McNamara, 1801 Elliott Avenue, St. Louis, Mo.

Bakers' and Confectioners' International Journeymen, Otto E. Fischer, 212 Bush Temple of Music, Chicago, Ill.

Barbers' International Union, Journeymen, Jacob Fischer, Box 517, Indianapolis, Ind.

Bill Posters and Billers of America, W. McCarthy, 1490 Broadway, New York.

Brushmakers' International Union, Geo. J. Vitzhun, 2052 Gates Avenue, Brooklyn, N.Y.

Blacksmiths' International Brotherhood of, W. F. Kramer, Rooms 570-585 Monon Building, Chicago, Ill.

Blast Furnace Workers and Smelters of America, International Association, William J. Clarke, 128 Sandusky Street, Buffalo, N.Y.

Boilermakers and Iron Shipbuilders of America, W. J. Gilthorpe, Room 7, Law Building, Kansas City, Kansas.

Bookbinders, International Brotherhood of, J. W. Dougherty, 222 E, Michigan, Indianapolis, Ind.

Boot and Shoe Workers' Union, C. L. Baine, 246 Summer Street, Boston, Mass.

Brewery Workers, International Union of, Joseph Twebstle, 247 Vine Street, Cincinnati, O.

Brick, Tile and Terra Cotta Workers, International Alliance, Wm. Van Bodengraven, 160 N. Fifth Avenue, Chicago, Ill.

Bridge and Structural Ironworkers, International Association of, H. S. Hockin, 422 American Central Life Building, Indianapolis, Ind.

Broommakers' International Union, C. T. Dolan, 3959 Lincoln Avenue, Chicago, Ill.

Bricklayers' and Masons' International Union, William Dobson, Oddfellows Building, Indianapolis, Ind.

Builders' Labourers' International Union, S. P. Johnson, 2326 East Eighth Street, Los Angeles, Cal.

Carpet Workers of America, F. A. McCaskee, Kensington Avenue, Philadelphia, Pa.

Carpenters and Joiners, United Brotherhood, Frank Duffy, P.O. Box 187, Indianapolis, Ind.

Carpenters and Joiners, Amalgamated Society, Thomas Atkinson, Room 76, Bible House, New York, N.Y.

Cement Workers, American Brotherhood of, H. T. Ullner, Mechanics Bank Building, San Francisco, Cal.

Carriage and Wagon Workers, International, W. P. Mavell, 403 South Division, Buffalo, N.Y.

Carvers' (Wood) Association of North America, International, Thos. J. Lodge, 10 Carlisle Street, Roxbury, Mass.

Carworkers, International Association of, G. W. Gibson, Rooms 1209-10 Star Building, 538 Dearborn Street, Chicago, Ill.

Chainmakers, National Union of U.S. of America, C. R. Stanton, Box 13 Maxwell, Ind.

Compressed Air Workers, International Union, Morris Winters, 210 Fifth Avenue, New York.

Curtain (Lace), Amalgamated Operators of America, Dav. L. Gould, 3141 Wendle Street, Philadelphia, Pa.

Cutting Die and Cutter Makers' International Union, Harry Reiser, 616 Sixth Avenue, New York.

Cigarmakers' International Union of America, George W. Perkins, Room 820 Monon Block, 320 Dearborn Street, Chicago, Ill.

Clerks' (Retail) International Protective Association, H. J. Conway, Drawer 248, Lafayette, Ind.

Coopers' International Union of North America, W. R. Deal, Bishop Building, Kansas City, Kansas.

Commercial Telegraphers' Union of America, The, Wesley Russell, 930 Monon Building, Chicago, Ill.

Cloth Hat and Cap Makers of North America, Max Zuckerman, 63 E. Fourth Street, New York, N.Y.

Conductors, Order of Railroad, W. J. Maxwell, Cedar Rapids, Iowa.

Electrical Workers, International Brotherhood of, Peter W. Collins, Pierik Buildings, Springfield, Ill.

Engineers, International Union of Steam, Jas. G. Hannahan, 6303 Harvard Avenue, Chicago, Ill.

Engineers, Locomotive Brotherhood of, W. B. Printer, 306 Society for Savings, Cleveland, Ohio.

Engineers (Stationary), National Association of, F. W. Raven, 323 Dearborn Street, Chicago, Ill.

Engineers and Machinists, Amalgamated Society of, Wm. Delahay, 74 Lafayette Street, N.Y.

Elevator Constructors, International Union, W. Young, 1952 North Nineteenth Street, Philadelphia, Pa.

Firemen (Stationary), Int. Bro. of, C. L. Shamp, Rooms 2-4, 2502 N. Eighteenth Street, Omaha, Neb.

Freight Handlers' and Warehousemen's Union of America, J. J. Flynn, 824 W. Harrison Street, Chicago, Ill.

Fur Workers of the U.S. and Can., Int. Association, A. V. McCormack, P.O. Box 124, Toronto, Canada.

Firemen and Engineers, Locomotive, Brotherhood of, A. H. Hawley, Peoria, Ill.

Flour and Cereal Mill Employees' International Union, A. E. Kellington, 316 Corn Exchange, Minneapolis, Minn.

Fitters' (Steam and Hot Water) International Association, W. H. Davies, Merrick Building, Chicago, Ill.

Foundry Employees, International Brotherhood of, G. Bechtold, 200 South Broadway, St. Louis, Mo.

Glove Workers' International Union of America, Agnes Nestor, Bush Temple of Music, Chicago, Ill.

Granite Cutters' International Association of America, Jas. Duncan, Hancock Building, Quincy, Mass.

Gold Beaters' National Protective Union of America, Thos. Delaney, 88 Barrow Street, New York.

Grinders' and Finishers' National Union (Pocket Knife), F. A. Didsbury, 508 Brook Street, Bridgeport, Conn.

Grinders' National Union (Table Knife), J. F. Gleason, 76 Chestnut St., Bristol, Conn.

Garment Workers of America, B. A. Larger, Rooms 116-117 Bible House, New York, N.Y.

Garment Workers' Union, International Ladies', John Alex. Dyche, 32 Union Sq., New York, N.Y.

Glass Workers (Window), Amalgamated, of America, Chas. Bryant, Electric Building, Cleveland, Ohio.

Glass Bottle Blowers' Association of United States and Canada, William Launer, Room 930, Witherspoon Building, Juniper and Walnut Sts., Philadelphia, Pa.

Glass Snappers' National Protective Association of America (Window), L. L. Jacklini, Kane, Pa.

Glass Workers' Amalgamated Association, International, William Figolah, 418 N. Clark St., Chicago, Ill.

Glass Workers' (Flint) International, W. P. Clarke, 929 Ohio Building, Toledo, Ohio.

Hatters of North America (United), Martin Lawlor, 11 Waverley Place, Room 15, New York, N.Y.

Horseshoers, International Journeymen, Hubert S. Marshall, 605 Second National. Bank Building, Cincinnati, Ohio.

Hod Carriers' and Building Labourers' International Union of America, A. Persian, Box 597, Albany, N.Y.

Hotel and Restaurant Employees' and Bartenders' International Alliance, Jere L. Sullivan, Commercial Tribune Building, Cincinnati, Ohio.

Iron, Steel, and Tin Workers' Amalgamated Association, M. F. Tighe, House Building, Pittsburg, Pa.

Jewelry Workers' International Union, W. J. Betz, 573 Adam St., Buffalo, N.Y.

Knights of Labour, J. Frank O'Meara, Bliss Building, Washington, D.C.

Lathers, International Union of Wood, Wire and Metal, R. V. Brandt, 401 Superior Building Cleveland, Ohio.

Laundry Workers' International Union, Ch. F. Bailey, 591 Second Av., Troy, N.Y.

Lake District International Seamen's Union, 121 N. Desplaines Street, Chicago, Ill.

Leather Workers on Horse Goods United Brotherhood, J. J. Pfeiffer, 209 Postal Building, Kansas City, Mo.

Leather Workers' Amalgamated International Union of America, John Roach, 326 Bank St., Newark, N.J.

Lithographers' International P. & B. Association of U. S. and Canada, John Treanor, 309, Broadway, N.Y.

Lobster Fishermen's International Protective Association, J. B. Webster, Vinal Haven, Me.

Longshoreman, International Association, J. J. Joyce, 1003 Mutual Life Building, Buffalo, N.Y.

Machine Printers and Color Mixers of U. S., C. McCrory, 81 John St., Hudson Falls, N.Y.

Machinists, International Association of, George Preston, 402 McGill Building, Washington, D.C.

Maintenance of Way Employees' International Brotherhood, S. J. Pegg, Vanol Building, St. Louis, Mo.

Moulders' International Union of North America, V. Kleiber, Box 699, Cincinnati, Ohio.

Marble Workers' International Association, S. C. Hogan, 715 Eagle Avenue, New York.

Meat Cutters' and Butchers' Workmen, International Union, Homer D. Call, Lock Box 212, Syracuse, N.Y.

Metal Polishers', Buffers', Platers' and Brassworkers' Union, C. R. Atherton, Neave Building, Cincinnati, Ohio.

Metal Workers of America (United), International Union, C. O. Sherman, 148 West Madison St., Chicago, Ill.

Mine Workers of America (United), Edwin Perry, 1106 State Life Building, Indianapolis, Ind.

Musicians, American Federation of, Owen Miller, 3535 Pine Street, Broadway and Market Streets, St. Louis, Mo.

Metal Workers, International Alliance of Amalgamated Sheet, J. E. Bray, 325 Nelson Building, Kansas City, Mo.

Pavers and Rammermen, International Union of, Ed. J. Hannah, 249 E 57th St., New York.

Paving Cutters' Union of U.S. and Canada, J. Sheret, Lock Box 27, Albion, N.Y.

Post Office Clerks, National Federation of, G. F. Pfeiffer, 187 Burleigh St., Milwaukee, Wis.

Potters, National Brotherhood of, J. T. Wood, Box 6, East Liverpool, Ohio.

Powder and High Explosive Workers of America, S. M. Stewart, Walmont, Ind.

Plasterers' International Association (Operative), T. A. Scully, Middletown, Ohio.

Painters', Decorators' and Paperhangers' Brotherhood of America, J. C. Skemp, Box 99, Lafayette, Indiana.

Paper Makers, United Brotherhood of America, J. T. Carey, 43 Benson Building, Albany, N.Y.

Patternmakers' League of North America, Jas. Wilson, Second National Bank Building, Cincinnati, Ohio.

Piano and Organ Workers' International Union of America, Chas. Dodd, 1037 Greenwood Terrace, Chicago, Ill.

Plate Printers (Steel and Copper), International Union of America, C. T. Smith, 612 F. N.W., Washington, D.C.

Plumbers', Gasfitters', Steamfitters' and Steamfitters' Helpers, United Association of United States and Canada, T. E. Burke, 401-6 Bush Temple of Music, Chicago, Ill.

Printing Pressmen, International Union, Jos. C. Orr, No. 9 Rogersville, Tenn.

Photo Engravers' Union of N. A., Louis A. Schwarz, 228 Apsley St., Philadelphia, Pa.

Quarryworkers' International Union of North America, Fred. W. Suitor, Scampini Building, Barre, Vermont.

Railway Carmen of America, Brotherhood of, E. W. Weeks, 507 Hall Buildings, Kansas City, Mo.

Railway Clerks, Order of, R. E. Fisher, 310 Kansas City Life Building, Kansas City, Mo.

Railway Employees (Street and Electric), Amalgamated Association, W. D. Mahon, 601, Hodges Block, Detroit, Mich.

Railroad Telegraphers, Order of, L. W. Quick, Star Building, St.Louis, Mo.

Railroad Trainmen, Brotherhood of, A. E. King, Cleveland, Ohio.

Railroad Freight and Baggagemen, Brotherhood of America, M. Cronin, Woodworth Building, Lancaster, Pa.

Roofers (Composition), Damp and Fireproof Workers of U. S. and Canada, International Brotherhood, Dan. J. Ganley, 14 N. Oxford St., Brooklyn, N.Y.

Rubber Workers' Amalgamated Union of America, Clarence E. Akerstrom, 25 Grant Street, Cambridge, Mass.

Sheet Metal Workers' Amalgamated International Alliance, John E. Bray, 313 Nelson Building, Kansas City, Mo.

Sawsmiths' National Union, F. E. Kingsley, 64 Baldwin Building, Indianapolis, Ind.

Seamen's International Union of America, Geo. C. Bodme, 51 South St., N.Y.

Shingle Workers' International Union of America, W. H. Reid, Maynard Building, Seattle, Wash.

Shipwrights', Joiners' and Caulkers' International Union of America, Thos. Durett, 108 Marshall St., Elizabeth, N.J.

Slate and Tile Roofers' International Union of America, J. M. Gavlock, 3643 W. 47th St., Cleveland, Ohio.

Steam, Hot Water and Power Pipe Fitters and Helpers, International Association of, W. H. Davies, Room 205, Merrick Building, Chicago, Ill.

Steam Shovel and Dredgemen, International Brotherhood of, T. J. Dolan, 134 Munroe St., Chicago, Ill.

Stonecutters' (Journeymen) Association of North America, Jas. F. McHugh, Drawer 2,348, Washington, D.C.

Slate Workers, International Union of, T. H. Palmer, Pen Argyle, Pa.

Spinners' International Union, Urban Fleming, 188 Lyman St., Holyoke, Mass.

Steel Plate Transferrers' Association of America, Denis H. Shirman, 1301 Madison N.W., Washington, D.C.

Stage Employees' (Theatrical), International Alliance, Lee M. Hart, State Hotel, State and Harrison Street, Chicago, Ill.

Stereotypers' and Electrotypers' International Union of North America, Geo. W. Williams, 29 Globe Building, Boston, Mass.

Switchmen's Union of North America, M. R. Welch, 326 Brisbane Building, Buffalo, N.Y.

Stove Mounters' International Union, J. H. Kaefer, 1210 Jefferson Avenue, Detroit, Mich.

Tailors' (Journeymen) Union of America, E. J. Brais, Box 597, Bloomington, Ill.

Teamsters', International Brotherhood of, Thos. L. Hughes, 222 E. Michigan St., Indianapolis, Ind.

Textile Workers, United, of America, Wm. Yates, 9 Mason St., Lawrence, Mass.

Tile Layers' and Helpers' (Ceramic, Mosaic and Encaustic), International Union, James P. Reynolds, Pittsburg, Pa.

Tin Plate Workers' International Protective Association of America, Arthur Watkins, Holmes Building, W. Va.

Tip Printers' International Brotherhood, T. J. Carolan, Newark, N.J.

Tobacco Workers', International Union of, E. Lewis Evans, Room 56, American National Bank Building, 3rd and Main Streets, Louisville, Kentucky.

Typographical Union, International, J. W. Hays, Rooms 640-50, Newton-Claypool Building, Indianapolis, Ind.

Travellers' Goods and Leather Novelty Workers' International Union of America, Murt. Malone, 203 Jefferson Ave., Oshkosh, Wis.

Upholsterers' International Union of America, J. H. Hatch, 233 First Av., New York.

Weavers' Amalgamated Association Elastic Goring, Alf. Haughton, 50 Cherry St., Brockton, Mass.

Weavers' Protective Association, America, Wire, A. A. Brooks, 229 Chesnut, 11 Columbus Ave., Holyoke, Mass.

Woodmen and Sawmill Workers' International Brotherhood, A. Livingston, Lothrop, Mont.

Woodworkers' Amalgamated International Union of America, Jno. G. Meiler, 35-38 N. Albany Av., Chicago, Ill.

RECENT LEGAL DECISIONS AFFECTING LABOUR IN ONTARIO.

Labour Gazette, February, 1912.

Injury Working in Trench.

An appeal to the Divisional Court by the plaintiff from the judgment of Hon. Sir John Boyd, Chancellor. Plaintiff, a labourer, working for defendant contractors, engaged in the construction of a trench or ditch in Port Arthur, was injured while in the bottom of the trench shovelling earth off the rock. He was struck on the head by a pole falling into the trench, which produced concussion of the brain and left him in a state of general shock, etc. The injuries were alleged to have been caused by the negligence of the defendants. Plaintiff claimd $5,000 damages. Chancellor Boyd at the trial dismissed the action without costs. The Divisional Court set aside this judgment and ordered a new trial on the ground that the evidence showed that plaintiff was where he ought to have been and where he had been ordered by defendants' foreman, and the defendants had failed to discharge the onus cast upon them of showing that the accident occurred through no fault of theirs. Costs of former trial and of this appeal were reserved for the judge who shall preside at the new trial.

(Magnussen vs. L'Abee, 20 O. W. R 502.)

Workmen's Compensation Act.

An action by Catharine Darke, widow and administratrix of Hugh Darke, for $10,000 damages, under the Workmen's Compensation for Injuries Act, the Ontario Factories Act, and also at common law, for the death of her husband. The defendant company possesses extensive works at Peterborough, where are manufactured electrical goods of various kinds, and the deceased at the time of the accident was in their service at a machinist's helper. The company was manufacturing a generator, and, before shipping it to the buyer, desired to submit it to an electrical test. Its parts were made in various buildings of the company's works; they were put together in the room for that purpose; and the machine was then bolted to the steel floor where it stood, that it might be secure and firm when being tested. The deceased was in attendance to render certain services, if necessary, after the power was turned on, but thinking the machine not sufficiently secured proceeded to further bolt it to the floor, and in order to get a better purchase on the wrench with which he was turning a nut on the bolt, knelt on a broad belt which the power when turned on set in motion. When he was so situate, Thompson, the electrician, not knowing of Darke being on the belt, turned on the power, whereby the deceased was carried between the belt and the pulley and crushed to death. One of the questions asked by the jury was whether the accident was caused by the negligence of any person in the service of the defendants who had any superintendence entrusted to him whilst in the exercise of such superintendence? The jury answered, "Yes." Chief Justice Mulock, the trial judge, held that having regard to the jury's answer to this question, that there was no evidence that Thompson had entrusted to him any superintendence over Darke, therefore, there was no liability under section 3. sub-section 2, of the Workmen's Compensation for Injuries Act. Another question asked of the jury was, by what authority, or at whose instance, was the deceased acting when endeavoring to further secure the machine just prior to the accident? The jury's answer was, "Jeffry's general order to look after the machine." The Chief Justice held that there was no evidence to support this find-

ing, that Darke was acting under the authority of his foreman, Jeffrys, when endeavouring to further secure the machine, so there was no liability under section 3, sub-section 3, of the Act. The Chief Justice also held that, at common law, the company would not be liable for the negligence of Thompson, who, as regards Darke, was a fellow workman. Thus there was no common law liability. He dismissed the action without costs.

(Darke vs. Canada General Electric Company, 20 O. W. R. 587.)

Damages for Injured Foot.

Frederick Bowyer, who was employed by the Toronto Electric Commissioners, was run over by a lorry on July 3rd last, while assisting some other employees to erect a fifty-foot pole at the southeast corner of Queen and York streets. While engaged in the work of supporting the pole by means of a pike pole, a waggon belonging to Hendrie & Company, Ltd., turned the corner, and the hind wheel passed over his right foot, breaking two bones in his ankle and crushing his foot, permanently injuring it. In an action in the non-jury court before Judge Denton for $500 damages, Bowyer claimed that his injuries were caused by the negligence of the driver of the wagon. The defence claimed that the plaintiff, when bracing the pole, moved his foot out under the wheel when the waggon was passing, and, therefore, the accident was due to plaintiff's own negligence. After hearing the evidence, Judge Denton allowed the plaintiff $300 damages and costs.

Damages for Negligence of Superintendence.

On the 8th day of May, 1911, the plaintiff, as a workman in the employ of the defendants, was engaged with other labourers in shovelling coal. The defendants were moving their coal and distributing it to different places upon their coal docks and on their extensive coal storing premises. This work was done by means of a hoisting gear and tramway system, hoisting coal in buckets or skips from a lower level and conveying it to any place desired, emptying coal from the full buckets or skips and returning empties to be refilled, etc. The shovellers below were doing their work apparently under the direction of a man also in the employ of the defendants. This man was called the "hooker," and he from below directed the motorman or engineer above when to stop, when to lower the empties, and when and where to stop to hoist the full buckets. At the time of the accident the the plaintiff was working on a night shift. In general the way the thing was done was to stop the hoist directly over the full bucket, and when the bucket was hooked on to the chain from the crane, or whatever that might be called, the signal was given to hoist. On the 8th day of May, 1911, the motor was not directly over the bucket, but rather over the plaintiff, who was working below, and when the bucket began to move up it swung from the vertical line and struck the plaintiff, severely injuring him by making a wound seven and one-half inches long directly across and through the wall of the abdomen. Mr. Justice Britton, who tried the action, found that the man called the "hooker," in superintendence for the defendants in and about the work of placing the buckets, lowering the empties, etc., was guilty of negligence, which caused the accident to the plaintiff. He also found that the system of the defendants, in moving this coal at night, was defective. Judgment for the plaintiff for $600 damages with costs.

(Flocks vs. Canadian Northern Coal and Ore Docks Co., 20 O. W. R. 652.)

Labour Gazette, March, 1912.

Mechanics' Liens.

Appeal by the plaintiff to the Divisional Court from the judgment of the Local Judge at North Bay, in an action to enforce three mechanics' liens. The defendant Rothschild, a merchant, was the owner of certain land in Cochrane; the defendant Eloy contracted to build upon this land a store in which to carry on the defendant Rothschild's business. The plaintiff was a merchant who supplied certain goods for this building. The plaintiff filed three mechanics' liens, and proceeded for their enforcement before the Local Judge at North Bay, who gave judgment in favour of the plaintiff as against the defendant Eloy, in regard to the amounts of the three liens; but, as against the defendant Rothschild, the Judge held that the plaintiff was entitled to the amount of the third lien only. The building contract, dated the 29th August, 1910, provided for the payment of $6,700 in instalments to the contractor after the rate of 80 per cent. of the value of work and material every fourteen days as the work proceeded; also, that time should be of the essence of the contract; and that the whole of the premises should be erected and completed internally so as to be in a fit and proper condition for commercial occupation and use within six weeks of the date of the contract, under a penalty of $20 per day for every day the owner should be denied full possession of the premises, either directly from party to party, or as an allowance from any sum due or to become due to the contractor. The building was not completed within the time agreed, and was never completed by the contractor. The contract price had not been paid in full for the work done by the contractor. It was held by the Divisional Court in this action by the material-man to enforce liens against the land, that, by reason of the penalty mentioned in the contract and the breach of the agreement on the part of the contractor, there was no sum "justly owing" or "payable" within the meaning of the Mechanics' and Wage-Earners' Lien Act, by the defendant, the owner, to the contractor, and the plaintiff was cut off from any relief under the Act. (*Farrell vs. Gallagher* (1911), 23 O. L. R. 130, approved and followed. The Divisional Court also held that, notwithstanding the use of the word "penalty" the sum of $20 a day was really liquidated damages. The authorities are reviewed in the judgment of the court, *Clydebank Engineering and Shipbuilding Co. vs. Don Jose Ramos Yzquierdo y Castaneda,* (1905) A. C. 6, being specially referred to. The judgment of the Local Judge at North Bay was affirmed.

(McManus vs. Rothschild, 25 O. L. R. 138.)

Accident Insurance.

In an action upon an accident policy issued by the defendants to the plaintiff, the assured, by the terms of which, in the case of temporary total disability, he was entitled to $25 a week for the period of disability, it was found that the plaintiff had suffered injuries resulting in a temporary total disability, within the meaning of the policy. The policy further provided that, if the injuries were sustained while the plaintiff was a "passenger" which meant, as defined by the policy, "while riding as a passenger in or upon a public conveyance provided by a common carrier for passenger service," he should be entitled to $50 per week. The plaintiff's injuries were sustained in this way. He was a passenger on an open street car: he got off upon the highway when he arrived at his destination, but, before he reached the sidewalk, was confronted by danger from a passing automobile; in

order to escape from that danger, he endeavoured to get on the street car again, and in doing so struck some part of the street car and was thrown down and so injured. The action was tried by Chief Justice Meredith, who held that the plaintiff, when injured, was still a "passenger" within the meaning of the policy; either as not having completely or safely alighted and so being still in the act of alighting; or as being in the act of getting on the car to be carried to a place where he might alight with safety; and, therefore, he was entitled to the double indemnity.

(Wallace vs Employers' Liability Assurance Corporation, 25 O. L. R. 80.)

Labour Gazette, April, 1912.

Accident to Miner.

The plaintiff, Siven, brought an action against the Timiskaming Mining Company to recover $3,000 damages for injuries sustained by the falling of a large rock down a shaft, alleged to be due to defective condition of the works, within provisions of the Ontario Mining Act, 1908, s. 164, s.-ss. 17, 31. The statement of claims alleged that the plaintiff while in the employ of the defendants as a miner, on the 13th of January, 1910, was engaged in running a drill at the bottom of a shaft in the defendants' mine, when a piece of rock came down the shaft and severely injured him. Claim was made that the injury was caused by a defective condition of the ways, works, etc., of the defendants' mine, whereby the same were left unprotected or insufficiently protected; that the defendants were further negligent by a failure to have its working parts examined by a competent officer, and in not ascertaining that they were in a safe and efficient working condition, and in not sufficiently protecting the head of such shaft as required by section 164, sub-sections 17 and 31 of the Mining Act, 1908, and amendments thereto. The defence stated that competent servants had been employed and supplied with proper material and appliances for the efficient maintenance of the defendant's premises, plant and business, and that the negligence, if any, was that of a fellow-servant; that the defendants' system of carrying on their business was the best and safest which they had been able to discover or devise, and that the plaintiff voluntarily assumed the risk; as to the claim under the Workmen's Compensation Act, that no notice of the claim had been given within the time specified in the Act, nor had the action been brought within the period therein prescribed. Chief Justice Falconbridge held that the defendants failed to comply with s.-ss. 17 and 31 of s. 164 of the Ontario Mining Act and gave judgment for plaintiff for $2,500 and costs. An appeal by the defendants in the Court of Appeal was heard by the Honourable Sir Charles Moss and ended in favour of the plaintiff after trial by jury, who delivered the following opinions: (1) That the plaintiff's injuries were caused by the negligence of the defendants. (2) That such negligence consisted of not providing proper pentice over the manhole. (3) That the defendants failed to comply with sub-section 31 of section 164, by examining the working shaft, level and stope, in order to ascertain that they were in a safe and efficient working condition. (4) That the plaintiff was not guilty of the negligence which caused the accident, or which so contributed to it that but for his negligence the accident would not have happened.

Non-Payment of Wages.

An important judgment was delivered at Hamilton on March 7th, when the Bowes, Jamieson Company were charged by five moulders with refusing to pay

wages that were due them. The evidence for the complainants, on behalf of whom Mr. J. G. O'Donoghue acted, was that they were employed by the firm for some time, but that, upon finding that they could make more money labouring than moulding decided to leave. The firm thereupon refused to pay them not only the wages for part of a week then not payable, but also for a whole week which had become due and payable but had not been paid. The employers proved that the men had been notified that if they left the employment without giving a week's notice they "forfeited all wages due." The magistrate would not give to this notice the wide meaning claimed by the employers, but what was likely to have been the meaning given to it by the men themselves, that the words "wages due" did not include wages due and payable, but wages credited to the men day by day, and he held that for the broken week the men had forfeited their wages, but not for the week which had expired. Following the decision it is reported that the company stated that the amounts given by the claimants as being due them did not tally with the amounts shown in the timekeeper's books. This matter was left for the men to settle with their foreman. Judgment was given for part payment of the amounts claimed by the men, a ruling which appeared to give satisfaction to the complainants.

Negligence of a Fellow-Workman.

The plaintiff, Magnussen, was working for L'Abbe and Bengsten in construction of a trench in Port Arthur when he was struck on the head by a pole falling into the trench, which produced concussion of the brain. The case, tried before a jury, was dismissed by Chancellor Boyd on the 28th of June, 1911, and a new trial without a jury was ordered by the Divisional Court. It was held by Mr. Justice Clout that the defendants were guilty of negligence in not taking proper precautions in shoring-up the sides of the trench or adopting other means to prevent the cave-in which caused the pole to injure the plaintiff. He further held that the defendant's foreman was guilty of negligence which caused injury to another man, and the defendants were liable for such negligence. Judgment was given in favour of the plaintiff with costs of action of former trial and appeal to Divisional Court.

Labour Gazette, May, 1912.

Injury to Servant.

In connection with the case noted on page 821 of the February issue of the *Labour Gazette* the judgment rendered by Chief Justice Mulock was reversed in the Divisional Court to which an appeal was made and which held that a person in "superintendence" need not necessarily exercise superintendence directly over the workman injured, nor that the workman should be acting under the immediate order of the superintendent. It was enough if the superintendent and the workman were both employed in the furtherance of a common object to the employer, although each might be occupied in distinct departments of that common object. Judgment for plaintiff was entered for $1.800 damages with costs of trial and appeal.

(Darke vs. Canadian General Electric Company.)

Master and Servant.

The administrator of the estate of one Delyea brought action against the White Pine Lumber Company to recover $2,300 damages for the death of the said

Delyea, alleged to have been caused by the negligence of the defendants. The deceased was a young man employed as a teamster at the defendants' lumber camp and was killed by the falling of a derrick in the construction of a log jamming machine. The Hon. Mr. Justice Clute gave judgment for $1,300 to be divided equally between deceased's father and mother, and costs. An appeal to Divisional Court was heard by Hon. Sir Glenholme Falconbridge, who held that, having in mind the risks of life and the possibility of the marriage of the deceased, the damages should be reduced to $950, subject to this, the appeal should be dismissed with costs.

Labour Gazette, June, 1912.

Non-Payment of Wages.

In the Hamilton Police Court a painter and paperhanger preferred a charge against his employer for alleged non-payment of wages due to him for work performed. The evidence showed that the plaintiff had been employed to paper a room on his own assurance that he was capable of doing it satisfactorily, the agreement being that no payment should be forthcoming if he failed to do so. After working for some time the man was discharged and claimed $6.50 in payment of work done. An experienced paperhanger gave his opinion of the work which showed it to be so unsatisfactory as to necessitate the room being done over again. The magistrate dismissed the claim saying that the man should not have represented himself as a first-class workman when he could not do first-class work.

Master and Servant—Injury to Servant.

An interesting case exemplifying the view of the Divisional Court as to the strictness with which employers of labour should be held to the observance of duties prescribed by statute for the protection of their employees was recently heard before Chief Justice Sir William Meredith. The case arose out of an appeal by the defendant from a judgment rendered by Mr. Justice Britton for $1,000 damages for injuries sustained by the plaintiff in the course of his employment. The evidence showed that the injuries were caused by the plaintiff's being near a revolving shaft which caught his clothes and threw him on to a moving pulley, inflicting serious bodily damages. His proximity to the shaft was due to his having removed the top of the guard covering it in order to apply to the belt a mixture necessary to prevent its slipping around the pulley. He stated that for the purpose of performing this operation it was necessary for him to step inside the guard, although he knew the unguarded condition of the screw. When the case was heard in the lower court the jury held that the defendant was guilty of negligence in not having the machinery guarded otherwise than it was guarded when the plaintiff was injured and that the plaintiff could not by the exercise of reasonable care have avoided the accident. The grounds of appeal chiefly relied on by the defendant's counsel were: (1) That there was no evidence of negligence to warrant the case being submitted to the jury, and if there was any negligence it was that of the plaintiff, who failed in his duty of foreman, within the meaning of section 6 of the Workmen's Compensation Act; (2) That the evidence established contributory negligence and that the finding of the jury on that question was perverse; (3) That the maxim *volenti non fit injuria* applied and that and that the fact that the plaintiff appreciated the danger of the work at which he was employed entitled the defendant to a judgment dismissing the action in the lower court. The Divisional Court held that the defendant was guilt of a violation of the Factories Act and absolved

the plaintiff of contributory negligence. In regard to the applicability of the maxim *volenti non fit injuria* in relief of a defendant guilty of a violation of a statutory duty such as is imposed by the Factories Act, the court held that the question was settled by a Divisional Court in England and the decision had also been followed by the courts of Canada. Mr. Justice Street, delivering a judgment in the case of Rogers v. the Hamilton Cotton Company, said: "The principle *volenti non fit injuria* has been held not to apply when the accident has been caused by the defendant's breach of a statutory duty. And even if applicable the knowledge of the workman of the existence of the defect has been considered to be merely an element in the question of contributory negligence." The appeal was dismissed with costs.

(McClemont v. Kilgour.)

Alleged Infringement of Union Label.

The plaintiffs, an international body, asked by the writ for an injunction restraining the H. A. Britton Company from using the new label which was alleged to be an infringement. This was a motion to compel the secretary of a new union calling itself "The United Garment Workers of Canada," to produce its books for examination. The counsel for the plaintiffs maintained that the newly formed organization was a bogus union started with a membership of thirty-five or forty of the Company's employees after the United Garment Workers had withdrawn its label from the defendant company. It was further stated for the plaintiffs that the organization was promoted merely to get a label, and they moved for a committal of the secretary, or for an order directing him to attend for re-examination and compelling him to produce the books of the union. The defendant company maintained that the case was an attempt to attack the Canadian Union and that the motion was unnecessary. It was held by the court that he secretary of the organization was within his rights in refusing to produce the books at this stage of the proceedings and the motion was dismissed with costs.

(United Garment Workers of America v. the H. A. Britton Co.)

Labour Gazette, July, 1912.

Lack of Proper Appliances.

At the Hamilton Assizes an action was brought by the Mercantile Trust Company, the administrators of a deceased Italian labourer, against the Canada Steel Company, to recover damages for the death of the man by reason of injuries received while working at the bottom of a vertical cylinder being erected by the defendants. The defendants were building a blast furnace, and in order to permit of the firebrick, etc., being sent up to the bricklayers for inserting a lining in the cylinder, a square shaft was inserted, running from the bottom to the floor upon which operations were carried on. This shaft was built at one side of the centre of the cylinder and tubs containing the materials for the bricklayers were sent up it. The deceased was working at the bottom of the shaft when a portion of a brick fell down the shaft and inflicted injuries which resulted in his death. It was contended that the employers should have had one or other of two appliances, one of which the evidence proved to be impracticable, and in the case of the other the jury before whom the case was heard were unable to agree whther the absence of the appliance was a defect or not, though deciding that the accident would not have happened if it had been present. It appeared from the evidence that the foreman

recognized the danger of material falling down the shaft and directed the deceased workman to keep from under the shaft; it was also shown that shortly before the accident a fellow-workman had been seen crossing the shaft and had warned him of the danger. The jury found that the deceased was not in his proper place; that he knew the danger and that he would not have been injured if he had been in his proper place. The Honourable Mr. Justice Riddell quoted a recent case coming under the British Compensation Act, which showed that there could be no recovery where the accident took place when the workman was doing a prohibited act. The House of Lords gave a decision dismissing the case in which a boy was killed in a coal mine while riding in a tub, a practice forbidden in the rules of the mine. In the present case it was strongly urged that all the default of the deceased might be due to inadvertence and that in the absence of an express finding of contributory negligence the plaintiffs might still recover. This argument was met by a decision of the Chancery Divisional Court sustaining a judgment of Mr. Justice Teetzel at a trial dismissing the action. In that case the deceased's work was to feed blocks to a circular saw wholly unguarded. The blocks were placed upon a car which itself ran to the saw upon a tramway. By reason of the arrangement of blocks, etc., there was great likelihood of the person feeding putting his foot upon the car and being carried at once to the saw. The deceased was accordingly warned by the foreman of the danger, but after working for some time in safety he put his foot upon the car with the result that he was carried to the saw and cut in two. The case of Wilson v. Davies, 10 O.W.R. 315, in the Court of Appeal was also referred to by Mr. Justice Riddell in dismissing the action with costs.

(Mercantile Trust Company vs. Canada Steel Company.)

Injury to Brakesman—Judgment Set Aside.

An appeal from the judgment of the Honourable Sir John Boyd was sustained in the Court of Appeal in regard to an action brought by a brakesman in the employ of the Canadian Pacific Railway Company, who lost his right arm while working for the company on March 8, 1911. As reported in the December issue of the *Labour Gazette*, the plaintiff was awarded $6,000 damages, and the higher court held that the injury could not be said to have been caused by the defendant's negligence or breach of statutory duty, as alleged by the plaintiff. The method adopted by the plaintiff to endeavour to effect the coupling was the very one most calculated to expose him to danger and risk of injury, and the appeal was allowed, the action being dismissed with costs, if exacted.

Question as to Superintendence.

The plaintiff, Demers, a carpenter in the employ of the Nova Scotia Silver Cobalt Mining Company, was seriously injured by being thrown from a wagon on account of the reckless driving, it was claimed, of an employee of the company. An action was brought to secure $5,000 damages under the Workmen's Compensation Act, but the Honourable Mr. Justice Middleton held that as the driver had no "superintendence" over the workmen driven by him to and from their place of employment, and as he was a fellow-servant of the plaintiff, the latter was not entitled to damages. The action was, theerfore, dismissed without costs.

Injury to Workman—Accident.

That the injuries received by an employe of the Tomiko Mills Company were due to an accident and not to negligence of the company was the decision rendered at North Bay by Mr. Justice Britton in dismissing an action for damages brought by the plaintiff against the defendant company. The plaintiff was employed to transport lumber from the defendants' mill to places in the mill-yard, where it was to be piled. A car was used for this purpose, the motive power for which was supplied by a locomotive. In October last the car was in charge of the plaintiff and another workman, and on one occasion the distance was so short that the plaintiff considered it unnecessary to use the locomotive and started the car by means of a bar. The car started more easily and travelled at a greater speed than he had anticipated, and in order to stop it from going beyond its piling place the plaintiff appears to have thrown a piece of board under the car with the result that the lumber, which was piled on the one side of the car, was precipitated from the car upon the plaintiff, who sustained a broken leg, and dislocation of his knee and shoulder. The action for damages brought against the company by the plaintiff was supported by the following charges of negligence on the part of the defendants: (1) That the car in question should have been supplied with brakes; (2) that one of the rails where the accident happened was twisted and bent, and had been so for a considerable time to the knowledge of the defendants; (3) that at the place where the front wheel of the car left the tracks there was a curve, and the resisting rail or outer rail should have been higher than the other, which was not the case; and (4) that there was not sufficient system of inspection of roadbed, track, and cars. Counter charges of negligence on the part of the plaintiff were alleged by the defendant company on the following grounds: (1) That the locomotive should have been used to haul the car; (2) that the car should not have been moved with its half load standing high and unsupported; and (3) the plaintiff should not have attempted to stop the car with a piece of board. The judge held that, considering the short distance the car had to go there was no negligence on the part of the plaintiff to move the car without the aid of the locomotive, nor was it negligence to move it without lowering the pile consisting of the half load on the car. The plaintiff did what a reasonably prudent man might have done under the circumstances. It was held, however, that the accident was a mere accident not attributable to negligence, and as such prevented the plaintiff fro recovering damages. In case of an appeal the damages were assessed by the judge at $1,000, one-fifth of the sum claimed.

(Rawlings vs. Tomiko Mills, Limited.)

Labour Gazette, August, 1912.

Damages for Death of Railway Employe.

An appeal by the defendants from a judgment of Hon. Mr Justice Clute, upon the findings of a jury, in favour of the plaintiff, the administratrix of the estate of Gilbert Jones. who was an engine-fireman in the defendants' service, and, when acting as such. upon a snow-plough train, who was killed in a collision, to recover damages for his death. The daughter is about twenty-one years of age, and the son about twelve. It was stated by defendants' counsel that an appeal would in all probability be taken. The defendants claimed negligence of the engineer of the deceased's train was the cause of the accident, and admitted liability under the Workmen's Compensation Act, paying into Court $2.000 in full

of all claims. The jury assessed the plaintiff's damages at $6,000, for which sum judgment was given in favour of the plaintiff with costs. The Court of Appeal held that there was a mis-trial of the case; that it was not presented to the jury as it should have been; and that consequently the jury's findings were inconclusive. It was also held that the plaintiff, having failed to establish a claim at common law, might in strictness have her action dismissed, if she refused to accept —as she did—the offer of judgment under the Workmen's Compensation Act. The appeal was allowed and a new trial directed with the costs of appeal to defendants.

(Jones vs. Canadian Pacific Railway Company.)

Dangerous Work—Contributory Negligence.

In the Divisional Court the judgment of Mr. Justice Riddell, delivered at the Hamilton Assizes, in the case of an action brought by the Mercantile Trust Company for damages for the death of a labourer employed by the defendant company was maintained, and the appeal dismissed with costs. Particulars of the previous trial will be found in the July report.

(Mercantile Trust Company vs. Canada Steel Company.)

Fatal Accident to Teamster.

The Grand Trunk Railway entered an appeal against the decision of Mr. Justice Teetzel, upon the findings of a jury, in favour of a widow of a teamster who met his death by being thrown from his wagon owing to want of repair of the roadway in the station yard. At the trial the defendants claimed that the roadway in question was not intended for use, and that another and proper roadway had been provided, which was the only one that the deceased was entitled to use. The evidence showed, however, that the first roadway had been for some time continuously used by teamsters in unloading cars, and that it was very convenient for this purpose. The Court of Appeal held that if the defendants did not intend the dangerous roadway to be used, they should have given notice to that effect or have stopped it up. The appeal from the previous judgment for $5,000 was dismissed with costs.

(Thompson vs. Grand Trunk Railway Company.)

Labour Gazette, September, 1912.

Negligence—Servant Disabled.

The plaintiff was injured while in the employ of the defendant company in its factory in the City of Hamilton, on January 13, 1911. On that date he was engaged in moving an iron beam when the hooks by which it was suspended slipped and the falling of the beam inflicted severe injuries. An action was brought to recover $2,000 damages which was dismissed in the trial Court. The plaintiff's damages were assessed, however, at $1,500 in the event of his being able to recover. The trial judge was of the opinion that the hooks used were made of the proper material and were in good order, and that in strength, shape and grasp they were sufficient for the work. His impression as to the cause of the accident was that the hooks had slipped, not from any defect in them, but that they had not been properly attached to the beam. The Divisional Court allowed the appeal and entered judgment for plaintiff for $1,500 and costs, holding that the evidence pointed to the use of the small hooks as the only cause of the accident, and that the exchange of the larger hooks for the smaller was negligence. The Court of Appeal dismissed appeal from above judgment with costs.

(Smith vs. Hamilton Bridge Co.)

Engineer on Steamer Killed.

An action was brought by the widow of William King, alleged to have been employed by the Northern Navigation Company as chief engineer on the steamer *Ionic,* for $1,000 for his death caused by falling through an open hatchway on the defendant's steamer *Huronic* in March, 1911, while crossing over its deck to get access to the *Ionic.* The dead body of the plaintiff's husband was found in the hold of the steamer, which was laid up at the dock for the winter. Deceased had been employed during the previous season and had been engaged for the next season as engineer on their steamer laid up alongside the one in which his body was found, and which he would have to cross to reach the other. He had apparently, in attempting to cross, fallen from the main deck through the hatch which had been left open and unprotected. No one saw him fall and the exact cause of death was not proved, but no suggestion of any cause other than a fall was made. The Divisional Court held that the jury were justified in finding that his death was due to a fall, but held upon the evidence that the deceased was not on the steamer in the course of employment, nor was he to be regarded as a licensee, and he was, therefore, a trespasser, and the defendants owed him no duty and were not liable for negligence in leaving the hatch open and unprotected. In the Court of Appeal the judgment of the Divisional Court was maintained, the Court holding, however, that the deceased was not a trespasser, but a bare licensee, which did not alter his legal petition as there was no evidence of active negligence on the part of defendants.

(King vs. Northern Navigation Company.)

Compensation for Injury.

An action for negligence and under the Workmen's Compensation Act. Plaintiff was an employee of defendants, and had been such for some time prior to 5th October, 1911, when he met with an injury complained of. The result of this injury was the plaintiff's inability to work, as he says, from 5th October, 1911, to early in March, 1912, and the more serious injury, the loss of the index finger of his left hand with consequent loss of power and inconvenience. Plaintiff earned $9 per week during his employment with defendants. Nothing was shown as to his earnings prior to that time. The plaintiff was engaged in running a barrel machine or "trusser," used in shaping and completing barrels and forcing tight the hoops on them. A barrel was placed on end on a stand. The operator touched a lever setting machine in motion (driven by electric power) which brought down with great force an iron disc ring on the top of the barrel, the staves just fitting on its interior, thus driving down tight the hoops on the barrel. It was then released, the barrel turned with the other end up and the operation repeated. A hammer was used to straighten the ends of the staves in case they were uneven or irregular. On the occasion in question the machine had come down and up again. Bettes, the operator, with hammer in his right hand, put his left hand to draw the barrel away when the machine came down again on the barrel, catching his hand, crushing it, and causing the injuries sustained and complained of. The plaintiff based his claim on two grounds: 1. By reason of the orders of the foreman, Kingdom, given specifically, to which he was bound to conform, and did conform, and by reason of such conformity the injury resulted. 2. By reason of defective plant and machinery. As to the first ground, the plaintiff employed by Edwards, to work under him. Kingdom gave the plaintiff charge of the machine in question, showing him its workings, and instructing him in its management.

He told him to work the lever with his left hand and change and remove the barrel with the same left hand, holding the hammer in his right; the reason given that by so doing he would save time. Plaintiff did as he was directed all the time that he was there, and it is stated such was the method pursued by previous operators. Plaintiff followed the foreman's instructions, and sustained the injury as the result. As to the second point of complaint the plaintiff said that on various prior occasions the belt running this machine had for some reason slipped over from the loose to the tight pulley and thus started the machine automatically. He stated that he notified the foreman on more than one occasion of this, calling his attention to this defect, which he said was the result of defective or worn babbitting on the shaft. The foreman said that he did not remember this, but the judge held that apart from the plaintiff's own evidence there was corroboration which he credited and found accordingly. Defendants contended that the injury must have been caused by plaintiff not stopping the lever at dead centre at the top—allowing it to go a little too far forward. If he did not stop exactly at dead centre it would go on, causing another revolution and another plunge downward of the heavy "trusser." The court held that the machine must on this occasion have started automatically, as it was shown to have done on prior occasions, and probably as the result of poor babbitting, as contended. This was such a defect as to render defendants liable. Judgment was accordingly entered for the plaintiff for $500, and costs of the action.

(Bettes vs. Quaker Oats Company.)

Labour Gazette, October, 1912.

Factory Inspection—Unsanitary Conditions.

A case was heard before Magistrate O'Keefe which is interesting as involving a principle to the effect that owners of premises are responsible to a considerable extent for sanitary conditions therein and arising from natural causes. Premises in the City of Ottawa in which were conducted two factories employing in the aggregate from fifty to one hundred hands, about eight per cent. of whom were females. were affected through a defective drain, it being so blocked up as to prevent its use in carrying off the storm water of yard and roof, as well as stable sewage, that affected these premises by soaking through basement walls and flowing over cellar bottoms to the extent that a dampness and effluvia were created which permeated the workrooms and building, causing unsanitary condition. The factory inspector notified the owner of the premises in the usual way to remedy the conditions complained of. The owner neglected to comply with the inspector's recommendations for a period over thirteen days. He (the inspector) laid an information before Magistrate O'Keefe. under section 15, Ontario Factory laws. The case was heard on August 12th, when by arrangement with counsel and inspector it was adjourned for one week, defendant promising in the meantime to bring his premises into conformity with requirements. At the expiration of the adjournment the inspector reported to the Court. through the Crown Attorney. that nothing of a permanent or satisfactory nature had been done. On the basis of renewed promises another week was granted, after which the inspector reported that some progress had been made, but that the work was still incomplete and in part unsatisfactory. At this point the Magistrate decided that if the work was not completed to the full satisfaction of the inspector within a week from that date (September 25th) he would impose a penalty of ten dollars per day for every day

in which a further default existed. At the expiration of the time so allowed, the inspector reported the work satisfactory under present conditions, but that the winter frost might affect the yard drain to the extent as to require attention again, and would be considered as accepted on this basis only. The Crown Attorney remarked that the defendant having pleaded "guilty," and having been put to a great deal of expense in making these improvements, he did not desire to press for a heavy penalty, although his indifference had cost the inspector a lot of trouble. The Magistrate strongly reprimanded the defendant for the trouble he had caused the inspector by his indifference to statutory requirements, and while he did not impose a penalty in this case, he warned him that if he did not keep his premises in a proper condition or was brought before him again on any similar charge, he would impose a very heavy penalty.

Master and Servant—Injuries—Negligence.

A case was heard before the Honourable Mr. Justice Lennox, in which the plaintiff was a workman who had been injured by an explosion of dynamite during drilling operations. The plaintiff brought an action under the Workmen's Compensation Act against his employer for $1,500. Judgment was rendered for payment of $1,446, being $1,500 less the amount paid out by defendant towards doctor's bills and hospital expenses. Directions were given that the execution be stayed for thirty days.

(Nigro v. Donati.)

Labour Gazette, November, 1912.

Strike Rioters Sentenced.

Two Italians were sentenced each to ten years' imprisonment at Port Arthur for having assaulted the Chief of Police during a riot following the strike of dock labourers at Port Arthur.

Injury to Workman.

An unsuccessful appeal to the Ontario Division Court from a judgment of Mr. Justice Mulock was recently made by a quarryman who was injured by the explosion of blasting powder while engaged in work for the Peters Coal Company. The facts of the case are as follows: The defendants operated a stone quarry in the township of Caledon, and at the time of the accident the plaintiff was engaged as one of their employees in getting out stone. The work was accomplished by drilling holes in the stone, charging them with blasting powder and exploding the charges. In November, 1911, the plaintiff, with two fellow workmen, had drilled a hole in the rock and had filled a pail of the blasting powder, carried it along with a coil of fuse to where the hole had been drilled, and there put in the charge. The plaintiff, refusing an offer of his fellow workmen to remove the pail, lit the fuse, and in passing the pail containing the unused portion of the powder by some means exploded it and was injured. Defendants were charged with negligence in supplying an open pail in which to handle the blasting powder, and at the trial they were considered negligent in doing so. From evidence given it was held by the Court that the sparks flew from the fuse into the pail and thus caused the explosion to which the plaintiff's injuries were due. Having regard, however, to plaintiff's experience as a quarryman, perfectly familiar with the dangers incident to the use of blasting powder and fuses, it was held by the Court that it was

negligence on his part to have deposited the pail within reach of the falling sparks and the action was, therefore, dismissed. The appeal to the Division Court was also dismissed with costs.

(Davidson v. Peters Coal Company.)

Non-Payment of Wages.

An important case was decided at Haliburton on October 11th. An Italian contractor purchased some timber lands and employed a number of his fellow countrymen to cut and manufacture the wood. Later on the contractor disappeared, and left his men in debt to many of the merchants of the place. The latter endeavoured to establish a lien upon the lands, but this was met by an objection on the part of the Italians, who proceeded to arrange for a Woodman's Lien. The presiding judge stated that the proper lien owners, namely, the Italian workmen, should be recompensed, and judgment was given in their favour.

Labour Gazette, December, 1912.

Negligence of Contractor.

An action was brought at Owen Sound under the Fatal Accidents' Act by a father for the death of his son, killed by an electric shock alleged to have been caused by the negligence of the contracting company for which the deceased was working at the time of his death. The defendant company had contracted with the town of Meaford for the construction of a certain bridge over a river, the work involving pile driving, and the machine used in this operation, containing much metal, had been placed by the contractors near the high voltage wires of an electric light company. The danger of the proximity of the machine to the wire was pointed out to the defendants by the superintendent of the electric light company, who received an assurance from them that precautionary measures would be taken to prevent the possibility of an accident. Such precautions were not taken, and the son of the plaintiff met his death as a result of the machinery coming in contact with the electric wire. In the action brought against the contractors, the town and the electric light company, the jury found negligence against the contractors in the erection of the pile driver upon insecure foundations and in working it so as to allow it to come in contact with the electric wires. Upon their findings judgment was given against the defendants, the contractors, for damages of $500. A question was submitted to the jury, asking whether there was negligence on the part of the electric power company in failing to remove their wires, as they knew of the erection of the pile driving machine, but the jury held that the manager of the company was justified in not taking any steps after the contractor had agreed to take precautionary measures to prevent a metallic contact with the wires. In regard to this action counsel for the plaintiff based his claim upon the theory that the electric light company, knowing that a condition of peril existed by reason of the conduct of the contractor, owed a duty to all who might be endangered by contact with the dangerous current, to see that such precautions were taken as would secure safety. The Court, however, held that the action against the electric company be dismissed with costs. The Court also held, in regard to the action brought against the town, that as complete control of the whole undertaking had been surrendered to the contractors, the municipality was not liable for damages in the case of an injured employee of the contracting company. The action, therefore, against the town was also dismissed.

(Johnston v. Clark & Son.)

Intoxicated Motorman Fined.

A Toronto Street Railway motorman was recently fined $50 and costs for being intoxicated while driving a car. The defendant also assaulted railway officials, but the charge in regard to this offence was not pressed.

Injury to Servant—Negligence.

A case was tried before a jury in Sault Ste. Marie in which a foreigner was injured while removing rock by blasting. On January 16th the plaintiff was working for the Serpent River Logging Company in the construction of a road over which it was their intention to haul timbers on limits owned by them. The blasting was done in the construction of this road, and the plaintiff was ordered to do the work. In doing it he was injured to such an extent as to lose the sight of both eyes. The plaintiff instructed his solicitors to bring an action against another company which was operating a lumber mill in the same place, and it was not until after twelve weeks from the time of the accident (the time allowed by the Workmen's Compensation Act) that the mistake was discovered. On the 2nd of July the plaintiff commenced the action in question against his employers. The defendants, in their statement of defence, did not allege want of notice, but on September 28th caused to be served on the plaintiff's solicitors the notice of their intention to rely on want of notice of injury as a defence to the action. The road foreman was aware of the accident and injury, and all particulars connected with them, having been present at the time. The Court held that there was reasonable excuse for the want of notice of injury, and that the defendants were not thereby prejudiced in their defence. Judgment was given for the plaintiff for $1,500 and costs, with thirty days' stay of proceedings.

(Quist vs. Serpent River Logging Company.)

Wrongful Dismissal.

An action was brought against the Canadian Pacific Railway Company by the plaintiff for wrongful dismissal from employment as a conductor, and for false imprisonment and malicious prosecution. The plaintiff had been in the employ of the defendant company for some twelve years, and during that period had borne a good character. His engagement with the company had been continuous, and, as stated by the superintendent, he was during all that period in the employ of the defendant company. Under the custom and practice of the company with their men, an employee of the grade of the plaintiff was not to be dismissed without inquiry. The occasion of his dismissal was on account of liquor having been found in the caboose of the train of which he was conductor. This train started from Cartier to White River; there was a collision, and the train was delayed. At the place where the collision occurred the debris arising therefrom had to be removed, and a number of workmen, twenty or thirty, were engaged in this work. The night was very cold, some fifty degrees, it was stated, below zero, and the men were constantly in the habit of going into the caboose to get warmed. The plaintiff, as was his duty, was at the station to be ready to start his train when the road was clear. One of the cars of the train was broken into at this time, and a case of liquor taken therefrom. The superintendent, searching the plaintiff's caboose, found one bottle and part of another in the caboose. The plaintiff was arrested and charged with stealing liquor, and immediately suspended. The case was tried before Judge Kehoe, and the plaintiff honourably

acquitted. He was, however, dismissed the day before the Judge had appointed to give his decision. Upon the evidence it was held that the plaintiff was not guilty of the theft, and did not know that the liquor had been secreted in his caboose. In the opinion of Mr. Justice Clute, under the evidence disclosed, he was wrongfully dismissed, under such circumstances having regard to his hiring, as to entitle him to three months' notice. It was held that the certificate given by the defendants to the plaintiff, showing the time he had served the company, and without which it was difficult to get employment in another company as conductor, was useless, as it contained a statement that he was dismissed on account of liquor having been found in his car. It was suggested on the trial that the plaintiff, having been honourably acquitted by the County Judge, the company might so modify the certificate as to show the facts, and thus enable an engagement with another company. Upon the whole case it was held that the conduct of the company towards the plaintiff was harsh and unfair in dismissing him the day before judgment was to be given. The costs in the case were not appreciably increased by the other issues raised, and under all the circumstances of the case, it was held that the defendants should have the costs of the issues in which they were successful, viz., those arising out of the charge of false imprisonment and malicious prosecution. Having regard to the plaintiff's earning power while with the defendant company, the Judge assessed the damages at $480, with full costs of action, and stated that any amendments that might be necessary to meet the case as disclosed in the evidence might be made.

Labour Gazette, January, 1913.

Strikers Fined for Assault.

At Porcupine on December 4 three Italians, two of them foremen of mines, in which a strike was in progress, were fined for assaulting an Austrian. The assault was made on account of his threatening with a revolver a crowd of strikers during a dispute on the railway station platform.

Damages for Injured Arm.

A judgment for $2,000 in favour of an employee of the Glen Woollen Mills was recently given by Mr. Justice Latchford. The employee in question was trying to adjust a belt on a shaft when the ladder on which he was standing slipped and he was thrown against the shafting, his left arm being torn out at the shoulder. In awarding the judgment above mentioned, the judge found that the shaft was not guarded and that it was defectively hung. He also found that negotiations regarding a settlement were entered into and protracted—deliberately, in his opinion—until six months had expired and an action under the Workmen's Compensation Act was barred.

(Gower vs. Glen Woollen Mills.)

TRADE DISPUTES IN ONTARIO.

Labour Gazette, February, 1912.

Strikes of Cloakmakers at Toronto, Ont.

On January 8, a strike of cloakmakers employed by Messrs. M. Pullan and Sons took place at Toronto, on account of the refusal of the employers to sign the agreement presented by the Joint Board of the Cloakmakers' Union of Toronto. The dispute was terminated on the 28th of January, when an agreement was signed on the following terms:—A new list of prices to be in force, equivalent to an increase of about ten to fifteen per cent. above the former rates. Piecework to be given out direct by the firm to workers, instead of to a sub-contractor, as formerly. Better sanitary regulations to be made in the workshop. There was no formal recognition of the union in the agreement. There were about sixty employees involved in this dispute, of whom thirty-five were male and twenty-five female employees.

On January 9 a strike of cloakmakers employed by the firm of Messrs. John Northway & Son took place at Toronto, with the object of obtaining an increase in wages. The dispute was settled on the following day, a slight increase being granted. About thirty-five male and fifty female employees were involved in this dispute.

Labour Gazette, March, 1912.

Strike of Structural Ironworkers at Toronto.

On February 19, forty-two structural iron workers in the employ of the Dominion Bridge Company, at Toronto, ceased work which was being done on the Canadian Pacific Railway office building. The men stated that they objected to risking their lives by working in the company of an incompetent person, who, they claimed, occupied a position of responsibility and was thus accountable for the safety of his fellow workmen. The Company, on the other hand, claimed that the men struck on account of the employment of men who did not belong to their union.

Strike of Cloak and Garment Workers.

On February 14, fifty-five men in the employ of the T. Eaton Company, of Toronto, were discharged for refusing to sew with machines the linings in women's coats. They claimed that this change in the method of finishing garments would deprive finishers of their work. On the following day 500 employees of the same Company, 200 of whom were females, were discharged for refusing to work.

Labour Gazette, April, 1912.

Strike of Iron and Steel Workers at Ottawa.

A strike of employees of the International Marine Signal Company, Limited, occurred at Ottawa on March 16. The men demanded payment on Fridays instead of on Saturdays, payment for overtime irrespective of whether full week's time had been worked or not, and recognition of Saturday afternoon as a holiday. Work was resumed on March 20, when the following adjustment was made, according to the statement of the Company:—(1) Men to be paid on any day desired except Friday, (2) overtime to be paid only after full week's time had been worked unless

in case of illness, etc., (3) Saturday afternoon to be recognized as a holiday during the summer months, when time and one-half will be paid if men are required to work. One hundred and eighty employees were affected by this strike.

Strike of Iron Moulders at Hamilton.

Thirteen employees of the Bowes. Jamieson Stove Foundry struck work on March 1 on account of a reduction of twenty-five per cent. in their wages.

Strike of Blacksmiths and Helpers at Ottawa.

Sixty men employed by the Ottawa Car Company went on strike on March 22. The cause of the dispute was a demand for increase in minimum wages, time and one-half for overtime, and a holiday on Saturday afternoons during the summer months, and a nine-hour day. The men commenced work on March 28, after they had been promised an increase of ten per cent. and at the rate of time and a half for overtime.

Strike of Tailors at Toronto.

On March 4 a strike of tailors occurred at Toronto. An agreement under which the men have been working expired on March 1, and attempts to reach a new agreement, involving certain changes in the working scale of prices, failed. Five hundred and fifty employees struck work. Since that time a number of firms individually have signed a new agreement, and more than two hundred strikers have returned to work.

Labour Gazette, May, 1912.

Strike of Boot and Shoe Workers at Toronto.

A strike of sixty employees of the Regal Shoe Company occurred on March 27, on account of an objection to the employment of an Italian laster. The men returned to work on the following day, the employee objected to being retained in the service of the Company.

Strike of Miners at Cobalt.

A strike of miners in the employ of the Temiskaming Mining Company of Cobalt occurred on April 28. According to the statement of the Company the strike took place on account of the dismissal of two employees for alleged intimidation of one of their fellow workmen. The strike was called off by the union on April 30, on its being intimated that the Company would allow all the men to return to work except the two discharged. One hundred and eighty men were affected by this dispute.

Strike of Wire Drawers at Hamilton.

A strike among the employees of the Canada Screw Company of Hamilton occurred on April 25, the cause of the dispute being the employment of two foreigners, who were given work in the wire drawing department. This dispute affected thirty-seven employees.

Strike of Checkers and Freight Handlers at Brantford.

Following a demand for increased wages a strike occurred among men employed in the freight department of the Grand Trunk Railway Company at Brantford, on April 17. Some of the men were taken back at the former rate, and the places of the others were filled. Thirty men were affected by this dispute which terminated on April 22.

Strike of Maintenance of Way Employees.

A strike of trackmen in the employ of the Grand Trunk Railway Company between Merritton and Niagara Falls, and also between Port Colbourne and Port Dalhousie, occurred on April 15. It was stated that the men sent a demand for higher wages to an official of the Company at Hamilton, and on the refusal of this demand stopped work.

Strike of Teamsters at Windsor, Walkerville and Sandwich.

Following a demand for increased wages, fifty teamsters in the employ of various building companies at the above-mentioned points struck work on April 22.

Labour Gazette, June, 1912.

Strike of Iron Workers at Hamilton.

Forty iron moulders and coremakers in the employ of the Kerr & Coombs Foundry Company, Limited, Hamilton, struck work on May 8, on the refusal of the Company to grant an increase in wages demanded by the men. The strike terminated on May 13, when the Company acceded to the demand of the employees, and granted a minimum wage of $3.00 per day for moulders and $2.75 for coremakers.

Strike of Plasterers at London.

Eight plasterers at London stopped work on May 1 on account of the refusal of the master plasterers to grant an increase in wages from thirty-seven to forty-five cents an hour. The men returned to work on May 4, without any agreement having been signed; the master plasterers, however, increased their wages to forty cents an hour.

Strike of Building Trades Employees at Hamilton.

A strike of one hundred and fifty employees in the building trades at Hamilton occurred on May 1. On the expiration of their agreement the men demanded an increase in wages, which the members of the Master Builders' Association refused. The increase demanded was at the rate of five cents per hour for the first year, two cents more for the second and an additional three cents for the third year. Several men were taken on by employers other than those of the Association, and at the end of the strike, which took place on May 7, there were only about one hundred and twenty men out of work. The men got an increase of five cents per hour, and signed an agreement for three years.

Strike of Teamsters at Hamilton.

Sixty teamsters in the employ of the City Corporation of Hamilton struck work on May 1, following a refusal to grant an increase in wages. The strike ended on May 3, when the teamsters accepted the offer made by the city, which provided for an increase of rather more than half of that demanded by the men.

Strike of Brickmakers at Hamilton.

A strike of thirty-six brickmakers occurred at Hamilton on May 11, the cause being given as the refusal of employing firms to grant an increase in wages demanded by the men. The strike was terminated on the 18th of May, the men having been granted an increase of two cents per thousand bricks.

Strike of Builders' Labourers at Hespeler, Preston and Galt.

Following a demand for increased wages a strike of one hundred and forty labourers in the employ of building contractors at the above-mentioned places occurred on the 1st of May. The strike terminated on the 18th of May, when seventy-five per cent. of the men returned to work with wages increased by half the amount demanded. The rest obtained other employment.

Strike of Bricklayers, Stonemasons and Plasterers, Hespeler, Preston and Galt.

A strike occurred among workmen in the building trades at the above places on May 20. The men wanted a new agreement, involving an increase in wages, which the employers refused. The dispute affected seventy-one men.

Strike of Coremakers at St. Catharines.

A strike of coremakers in the iron foundry of the McKinnon Dash Company at St. Catharines, took place on May 9. Twenty-six coremakers presented a petition that unless the Company discharged the girls in the core room they would stop work. The Company stated that at the end of the month a few of the men had returned to work, but that the majority of them had either left the city or obtained other employment.

Strike of Iron Moulders at Peterborough.

A strike affecting fifty-nine moulders directly and thirty indirectly took place at Peterborough on May 13. The dispute was caused by a demand for a nine-hour day at the same minimum wage as formerly. On the 21st of the month two of the four firms had agreed to the terms of the men.

Strike of Machinists and Helpers at Ottawa.

At the beginning of the month a demand was made by the men in the locomotive and car repairing shops of the Ottawa and New York Railway Company for a ten per cent. increase in pay. Negotiations commenced on May 7, and the demands were modified, the men asking for ten per cent. for skilled labour and seven and one half per cent. for unskilled labour. On May 21 the men stopped work, but resumed on the 23rd, pending a completion of negotiations. This took place on May 23rd, when the men were granted an increase of ten per cent. in the case of skilled workmen and seven per cent. in that of unskilled. Thirty-nine men were involved in this dispute.

Strike of Cigar Makers at Stratford.

A strike of cigarmakers occurred at Stratford on May 6, following a demand for an increased bill of prices. Thirteen employees were directly and ten indirectly affected by this dispute, which terminated on May 7, the employer agreeing to raise the price by $1.00 per thousand cigars.

Strike of Garment Workers, Toronto.

A strike of garment workers occurred in the employ of Messrs. Rosminsky & Stein, at Toronto, on May 16. The Company stated that the cause of the dispute was that they hired a man to fill the place of an employee who had left, giving him an increase in wages over that received by the latter, who had only been in the employ of the Company for six or seven weeks. Fifty-five persons were directly affected by this dispute.

Strike of Plumbers at Kingston.

A strike of twenty-eight plumbers occurred at Kingston on May 1. The men struck for an increase in wages and reduced hours, making a demand for $3.00 per day instead of $2.55, and for eight hours per day instead of nine. A compromise was effected, and the strikers returned to work on May 27. The arrangement provided for an increase in wages to $2.75 per day of eight hours until May 1, 1913, when $3.00 per day will be paid for a day of eight hours until May 1, 1914.

Labour Gazette, July, 1912.

Strike of Carpenters at Ottawa.

On June 1, four hundred carpenters, in the employ of fifty-five contractors, stopped work at Ottawa on account of the refusal of the employers to grant an increase in wages and other changes in conditions. The agreement was signed from time to time during the month; and by the end of June there were only about fifty men still on strike.

Strike of Carpenters at Kingston.

On June 1, a strike of sixty-five carpenters occurred at Kingston, the men demanding an increase in wages. An agreement was signed on June 3, when the men returned to work.

Strike of Lathers at Toronto.

Following a demand for an increase in wages, about two hundred lathers at Toronto stopped work on June 3. A settlement was arrived at during the month.

Strike of Builders' Labourers at Hamilton.

On June 10, a strike occurred among the builders' labourers employed by Messrs. Laughlin & Company, a demand for an increase in wages having been refused by the Company. The men returned to work on the following day under conditions existing before the strike, but it is understood that the Company granted the men a voluntary increase shortly afterwards.

Strike of Plumbers at Windsor and Walkerville.

On June 24, a strike occurred among the plumbers employed by eight firms in Windsor and Walkerville, a demand for an increase in wages and shorter hours being given as the cause.

Strike of Iron Moulders at Ottawa.

On June 6, a strike of iron moulders occurred at Ottawa, the cause being a demand for shorter hours and an increase in wages. At the end of the month it was reported that two foundries had granted the increase.

Strike of Freight Handlers at Port McNicol.

A strike of three hundred freight handlers was reported to have taken place at Port McNicol on June 19, after a demand on the part of the men for an increase in wages.

Strike of Gas Workers at Toronto.

A strike of one hundred and sixty-five men in the employ of the Consumers' Gas Company occurred on June 18. In regard to this dispute the Company stated that thirty-six men were laid off during repairs to a part of the plant and that

others struck work on the declaration of the superintendent that he was unable to promise that they would be taken back on the resumption of operations. No definite termination of this dispute had been reported to the Department at the end of the month, though, according to the Company's statement, the majority of the strikers had returned to work at that time, and others were being taken back as soon as work could be found for them.

Labour Gazette, August, 1912.

Strike of Carpenters at Port Arthur.

On July 1st, two hundred carpenters at Port Arthur stopped work on account of the refusal of the employers to grant a revision of the old schedule, the change providing for an increase of wages and a reduction in working hours.

Strike of Painters at Kingston.

A strike of painters in the employ of three firms at Kingston occurred on July 2nd, the cause being a request for an increase of twenty-five cents per day and a reduction of six hours per week.

Strike of Coremakers and Moulders at Walkerville.

A strike of core makers and moulders employed at the Kerr Engine Works at Walkerville occurred on July 26th, the cause being a demand for a reduction of hours from ten to nine hours per day. Twenty- seven employees were affected by this dispute.

Strike of Electrical Workers at Ottawa.

About one hundred electrical workers went on strike in Ottawa on July 19th, to enforce a demand for an eight-hour day and a thirty-five cent. minimum wage per hour, instead of a nine-hour day with a minimum wage of thirty cents per hour. It was reported to the Department at the end of the month that twenty-two men were then on strike, several firms having agreed to the strikers' demands.

Strike of Printers at Woodstock.

On July 4, about thirty printers in the offices of the *Sentinel Review* and the *Express* went on strike to enforce demands contained in a new agreement. On July 22nd the printers employed at the *Express* office, to the number of seven, returned to work under a temporary agreement. In the case of those employed at the *Sentinel Review* office no settlement of the dispute was reported at the end of the month.

Strike of Freight Handlers at Port Arthur.

A strike of coal handlers in the employ of the Canadian Northern Coal and Ore Dock Company of Port Arthur occurred on July 29th, on account of alleged discrimination against union men and a demand for higher wages in the boats and coal-loading machines.

Strike of Civic Labourers at Ottawa.

A strike of civic labourers occurred in Ottawa on July 10th, the men demanding twenty-five cents per hour in place of twenty-two. A termination of this dispute, which affected about 1,000 workmen, took place on July 12th, on which date the men returned to work, having been granted an increase of two cents per hour, same taking effect from July 1st.

Strike of Railway Labourers at Hamilton,

A strike of thirty-six railway labourers in the employ of the Toronto, Hamilton and Buffalo Railway, occurred in Hamilton on July 29th, on account of the refusal of the Company to accept a demand of the men for eleven hours' pay for ten hours' work. A majority of teh men returned to work on the following day under conditions existing before the strike, and the places of the others were filled by the Company.

Labour Gazette, September, 1912.

Strike of Plasterers at Ottawa.

A strike of plasterers occurred at Ottawa on August 1st, the men demanding an increase of five cents per hour, and also payment weekly instead of fortnightly. The dispute ended on August 5th, when an agreement was signed providing for the increase demanded, the men waiving their demand for weekly payment. Thirteen firms employing sixty-six men were directly affected by this dispute.

Strike of Plumbers and Steamfitters at Brantford.

Twenty-six plumbers and steamfitters in the employ of ten firms struck work at Brantford on August 1st, on account of the refusal of employers to raise the minimum rate of wages and to make other changes.

Strike of Iron Workers at Hamilton.

One hundred and fifty men in the employ of the Steel Company of Canada, Hamilton, stopped work on August 26th, following a demand for an increase in wages. After a conference the company and men arrived at an agreement and work was resumed on August 28th.

Strike of Shirt Ironers at Hamilton.

A strike of shirt ironers of the Van Allan and Regal Shirt Factories at Hamilton occurred during the month, the cause being a demand for an increase from 52 to 60 cents per dozen shirts. Twenty-four employees of the first-named factory stopped work on August 3rd and resumed on August 13th, eighteen employed in the Regal Shirt Factory struck on August 6th and went back to work on August 16th. In both cases the men were granted an increase of five cents per dozen shirts.

Strike of Boot and Shoe Workers at Berlin.

A strike of lasters in the employ of the Kimmel Felt Boot Company, at Berlin, occurred on August 9th, the cause of the dispute being due to the firm not giving the men insoles and outsoles at the same time. Nineteen men were affected by this dispute, which was terminated on August 12th, the firm granting their demands.

Strike of Freight Handlers at Port Arthur.

Freight handlers employed by the Canadian Northern Railway Company struck work at Port Arthur on August 19th. The men demanded 30 cents per hour in place of 20½ cents as before. The company offered an increase of two cents, which was refused by the men, who reduced their demands to 27½ cents per hour, 40 cents for overtime, and 30 cents for handling cement. The strike was terminated on August 24th, when the men accepted the company's offer of an increase of 2 cents per hour.

Strike of Freight Handlers at Fort William.

Sixteen hundred freight handlers in the employ of the Canadian Pacific Railway Company at Fort William struck work on August 20th, demanding higher wages. Work was resumed on August 24, the men going back under conditions existing before the strike.

Strike of Teamsters at Ottawa.

Teamsters to the number of seventy went on strike at Ottawa on August 16th after a demand for an increase in wages.

Strike of Dock Labourers at Fort William.

About two hundred and fifty employees of the Fort William Stevedore Company went on strike on August 7th for an increase of five cents per hour. A compromise was effected on August 13th and the men returned to work.

Strike of Musicians at Toronto.

Theatrical musicians in Toronto went on strike on August 17th for higher wages. This dispute, which involved seventy employees, was left unterminated at the end of the month.

Labour Gazette, October, 1912.

Strike of Carpenters at Niagara Falls.

A strike of seven carpenters at Niagara Falls took place on September 2. The dispute appears to have arisen by reason of the termination of an agreement by which the local unions of the United Brotherhood of Carpenters and Joiners of America and the Amalgamated Society of Carpenters and Joiners had mutual recognition as union men. Members of the first-named organization claimed that the members of the other union are non-union men and refused to work with them.

Strike of Builders' Labourers at Toronto.

It was reported in the press that about twenty marble workers' labourers struck work on September 25th, demanding an increase of seven cents per hour in their wages. Four firms were concerned in this dispute.

Labour Gazette, November, 1912.

Strike of Miners at Cobalt.

Miners working in the Townsite Mines at Cobalt, to the number of 225, went on strike on October 19th on account of the refusal of the employers to reduce their working hours from ten to nine per day.

Strike of Tile Layers at Toronto.

A strike of about 100 members of the Tile Layers' and Helpers' Union took place at Toronto on October 2nd because several of the employers had not signed an agreement respecting recognition of the union and shop rules. The difficulty was adjusted and the men returned to work on the 7th.

Strike of Stage Employees at London.

Fourteen stage employees working at the Grand Opera House, London, struck work on October 31st. The primary cause of the strike was the objection of the employees to a reduction in their staff, and later the dismissal of one of their number.

Labour Gazette, December, 1912.

Strike of Miners at Porcupine.

A strike affecting about twenty-five mines and twelve hundred employees occurred at Porcupine on November 15th. Some time ago some of the mines announced a reduction of wages to be paid to their employees, and the matter was referred to the Department of Labour. A Conciliation Board was appointed to deal with the question, the award of which was not acceptable to the employees, and a strike followed.

Strike of Iron Moulders at Sault Ste. Marie.

A cessation of work took place on November 11th among employees of the Algoma Steel Works, the cause of the dispute being a reduction in overtime rates. The men claimed that the dispute was a lock-out owing to their refusal to accept a reduction; the company, on the other hand, stated that the works had been taken over by the steel company, necessitating a change in system. About 200 men were involved in this dispute.

Strike of Iron Moulders at Waterloo.

Twelve iron moulders in the employ of the Waterloo Manufacturing Company struck work on November 11th on account of the employment by the firm of a certain apprentice at nearly the same rate of wages as that paid to journeymen. The strike terminated on November 21st, when the apprentice was laid off and the men returned to work.

Strike of Automobile Painters at Walkerville.

A strike of employees of the American Auto Trimming Company, Limited, occurred on November 3rd. The company, in a communication to the Department, stated that five men declined to accept a price for piecework which allowed them to make a minimum wage of $6 per day, and were discharged by the company. About ten others from another department went out in sympathy, and, according to the statement of the company, their places were filled and the factory was running in normal capacity at the end of the month.

BRITISH LABOUR NEWS.

Co-Operative Societies.

At the end of 1911 there were at work in the United Kingdom 1,535 Industrial Co-operative Productive and Distributive Societies, with an aggregate membership of 2,682,942, as total share, loan, and reserve capital of £53,652,644, a total trade (distributive and productive) of £136,538,989, and a total profit, before payment of interest, on share capital, of £12,926,383. The total number of persons employed by the societies was 126,942, and the total amount of wages paid during

the year £7,339,090. This is a decrease on 1910 of 27 societies, but an increase of 97,821 members, £3,141,582 in capital, £4,735,506 in sales, and £958,825 in profit. The societies are of various types, some being engaged only in distribution and some only in production, while others are engaged in both productive and distributive operations. Of the total profit of £12,440,416, a sum of £11,693,920 was made by the retail societies, and £746,496 by the wholesale societies. In the case of the retail societies, the greater part of the profit was distributed to the members as a dividend upon purchases, at an average of 2s. 6¼d. in the pound, and in the case of the wholesale societies, English and Scottish, a dividend to members of 4d. and 8½d. in the pound respectively.

Membership of Trades Unions in 1911.

At the end of 1911 the total membership of the 1,168 registered and unregistered Trade Unions known to the Department was 3,010,346, an increase of no less than 23.3 per cent. as compared with a year ago. This is the greatest annual rate of increase recorded during the period for which comparative figures are available (1892-1911), the highest previously attained being 13.9 per cent. in 1907. The past year was characterized by important disputes in the transport trades, and it was in this group that the rate of increase was most marked. In unions of seamen and canal, dock, and wharf labourers the membership in 1911 was treble that in 1910: the combined membership of unions of transport workers and general and builders' labourers showed an increase of 102.9 per cent., as compared with 8.9 per cent. for all the remaining unions. In this connection it will be remembered that the upheaval in the transport trades in 1889-90 was also accompanied by a very large increase in the membership of the Trade Unions affected.

Federations of Trade Unions and Trade Councils.

The number of Federations of Trade Unions in existence at the end of 1911 was 110, with a membership of 3,812,599, an increase of 13.2 per cent. compared with 1910, and of 107.2 per cent. compared with 1902. This is the gross membership, in which many trade union members are counted more than once, owing to some unions being affiliated to more than one Federation. The largest Federations were the General Federation of Trade Unions, with a membership of 861,482 (an increase of 21.4 per cent. compared with 1910), the Miners' Federation of Great Britain, with a membership of 588,000 (a decrease of 1.5 per cent.), the Federation of Engineering and Shipbuilding Trades of the United Kingdom, with a membership of 401,472 (an increase of 7.9 per cent.), and the National Transport Workers' Federation, which was established in 1911, and had a membership of 200,185 at the end of the year. At the end of 1911 the number of Trades Councils in existence was 247. Their affiliated membership was 1,176,551, an increase of 16.4 per cent. compared with 1910, and of 44.8 per cent. compared with 1902.

Changes in Wages.

The total number of workpeople whose rates of wages were reported as being changed in the first quarter of 1912 was 174,290, as compared with 309,180 in the corresponding period of 1911. The changes arranged gave 166,971 workpeople a net increase of £7,441 per week, and 6,620 workpeople a net decrease of £31 per week, while the remaining 699 workpeople had an upward and a downward change, which left their wages at the same level as at the beginning of the

year. The net effect of all the changes was thus an increase of £7,410 per week as compared with an increase of £3,205 per week in the corresponding period of 1911.

Changes in Hours.

The total number of workpeople reported as affected by changes in hours of labour in the first quarter of 1912 was 13,687, the aggregate amount of the reductions being 19,800 hours per week.

Trade Disputes.

For the first quarter of 1912 the number of trade disputes was 152, the number of workpeople affected was 1,094,855, and the aggregate duration in working days 27,867,400, as compared with 134, 67,923, and 1,883,100 respectively in the corresponding period of 1911.

Lead and Other Poisoning.

During the first quarter of 1912 there were 177 cases and 11 deaths from lead and other poisoning and anthrax in factories and workshops, as compared with 150 cases and 10 deaths in the corresponding period of 1911. There were also 52 cases and 6 deaths from lead poisoning among painters and plumbers as compared with 49 cases and 12 deaths in 1911.

Fatal Industrial Accidents.

During the first quarter of 1912 the total number of workpeople reported as killed in the course of their employment (exclusive of seamen) was 678, as compared with 714 in 1911. The total of seamen killed in the same period was 528 in 1912 and 502 in 1911.

Unemployed.

In the 392 Trade Unions, with a membership of 675,535, making returns, 76,144, or 11.3 per cent., were returned as unemployed at the end of March, 1912, compared with 3 per cent. at the end of March, 1911.

Changes in Wages.

The total number of workpeople whose rates of wages were reported as being changed in the first half-year of 1912 was 753,415, as compared with 605,612 in the corresponding period of 1911. The changes arranged gave 724,720 workpeople a net increase of £40,431 per week, and 28,695 a net decrease of £887 per week. The net effect of all the changes was thus an increase of £39,544 per week creased by 344 per week and 38,762 had theirs decreased by 67,114 per wee.

Changes in Hours.

The total number of workpeople reported as affected by changes in hours of labour in the first half-year of 1912 was 39,447. Of these 685 had their hours increased by 344 per week and 38,762 had their decreased by 67,114 per week.

Trade Disputes.

For the first half-year of 1912 the number of trade disputes was 363, the number of workpeople affected was 1,260,461, and the aggregate duration in working days 37,444,200, as compared with 277, 194,441, and 4,184,300 in the corresponding period of 1911.

Lead and Other Poisoning.

During the first half-year of 1912 there were 316 cases and 27 deaths from lead and other poisoning and anthrax in factories and workshops, as compared with 334 cases and 24 deaths in the corresponding period of 1911. There were also 109 cases and 18 deaths from lead poisoning among painters and plumbers, as compared with 113 cases and 27 deaths in 1911.

Fatal Industrial Accidents.

During the first half-year of 1912 the total number of workpeople reported as killed in the course of their employment, exclusive of seamen, was 1,342, as compared with 1,399 in 1911. The number of seamen killed in the same period was 1,555 in 1912 and 641 in 1911.

Unemployed.

In the 390 Trade Unions. with a net membership of 833,948 making returns, 20,698 or 2.5 per cent. were returned as unemployed at the end of June, 1912, as compared with 3 per cent. at the end of June, 1911.

Changes in Wages.

The total number of workpeople whose rates of wages were changed, as far as reported in the nine months ending September 30, 1912, was 1,173,786, as compared with 754,576 in the corresponding period of 1911. The changes arranged gave 1,152,267 workpeople a net increase of £79,197 per week, and 15,957 a net decrease of £376 per week, whilst 5,562 had upward and downward changes which left their wages at the same level as at the beginning of the year. The net effect of all the changes was thus an increase of £78,821 per week as compared with an increase of £17,592 per week in the corresponding period of 1911.

Changes in Hours.

In the nine months ending Sept. 30, 1912, the number of workpeople whose hours were changed was 51,287, and the aggregate amount of the reduction was 115,718 hours per week.

Labour Disputes.

The number of disputes causing stoppage of work in the first nine months of 1912 was 567, involving 1,365,250, with an aggregate duration of over 39½ million working days.

Unemployed.

In the 383 Trade Unions, with a net membership of 877,811, making returns, 18,785 or 2.1 per cent. were returned as unemployed at the end of September, 1912, as compared with 2.9 per cent. at the end of September. 1911.

Industrial Diseases.

During the first nine months of 1912 the total number of lead and other poisoning and of anthrax in factories was 485, as compared with 560 in 1911. The total number of deaths for the same period in 1912 was 38, the same as in 1911. In addition there were 185 cases of lead poisoning and 33 deaths among house painters and plumbers in the first nine months of 1912, as compared with 193 cases and 38 deaths in 1911.

Fatal Industrial Accidents.

During the first nine months of 1912 the total number of workpeople reported as killed in the course of their employment (exclusive of seamen) was 2,173, as compared with 2,141 in 1911. The number of seamen killed in the same period was 1,740 in 1912 and 857 in 1911.

Changes in Wages.

The number of workpeople reported as affected by changes in rate of wages in 1912 was 1,724,049, of whom 1,712,242 received a net increase of £131,617 per week, and 57 sustained a net decrease of £6 per week, while 11,750 had upward and downward changes, which left their wages at the same level at the end as at the beginning of the year.

Changes in Hours.

The changes in weekly hours of labour taking effect in 1912 affected 72,607 workpeople; of these 701 had their hours increased by 366 per week, and 71,366 had reductions amounting to 175,068 hours per week.

Labour Disputes.

The total number of trade disputes, causing a stoppage of work in 1912, was 821, involving directly or indirectly 1,437,032 workpeople, with an aggregate duration of over 40 million working days.

Unemployed.

In the trade unions, with a net membership of 894,297, making returns, 20,938, or 2.3 per cent. were reported as unemployed at the end of December, 1912, as compared with 3.1 per cent. at the end of December, 1911.

Industrial Poisoning.

During the twelve months of 1912 the total number of cases of lead and other poisoning and of anthrax in factories was 656, as compared with 755 in 1911. The number of deaths was 50 in 1912, as compared with 49 in 1911. In addition there were 256 cases of lead poisoning, including 47 deaths, among house painters and plumbers in 1912, as compared with 263 cases and 48 deaths in 1911.

Fatal Industrial Accidents.

During 1912 the total number of workpeople reported as killed in the course of their employment, exclusive of seamen, was 2,994, as compared with 2,960 in 1911. The total number of seamen killed was 1,983 in 1912, as compared with 1,254 in 1911.

APPENDIX.

Municipal Returns.

ELIZABETHTOWN, Tp.—Number of buildings erected 5; cost about $6,400. Amount expended on permanent improvements $6,457. Amount expended on sanitation $103. J. S. Webster, Township Clerk, Bellamys.

BURPEE, Tp.—No new buildings erected. Amount expended on permanent improvements, $400. Norman Bailey, Township Clerk, Evansville.

Manufacturers.

Woodenware; capital employed $10,000. Number of days in operation 300. Gross value of product $18,000; about the same as previous year. Amount paid for taxes $32. Insurance $300. Total number of employees, male 25, female 3. Total wages, male $8,500, female $750. Total salaries to clerks, etc., $9,850. Increase in wages about 5 per cent.

Changes Trades and Labour Councils.

Berlin—Urban Strub, 52 Elm St. West.
Brockville—Fred. Clow, Brockville.
London—Jos. S. Hill, Lenwood St. Knollwood Park.
Peterborough—Ch. Hammacott, 267 McDonnel St.
Port Arthur—E. Hapberg, 232 Wolseley St.
Toronto—J. H. H. Ballantyne, Labour Temple.
Welland—Rich. Riley, Box 307.

Fig. 1.—The Little Silver Vein, southwest corner of location R. L. 104, on the Nipissing property. The cliff is about 70 feet in height and is composed of almost horizontally lying rocks of the Cobalt series. At the bottom are about 15 or 20 feet of well banded slate-like greywacké. This is followed by about the same thickness of feldspathic quartzite, overlying which, at the top of the cliff, is coarse conglomerate. The greatest thickness of the vein, as originally exposed, was about 8 inches. The strike is east and west, and the dip, as the photograph shows, is almost vertical. Ore to the value of about $300,000 was extracted from this vein.

REPORT OF THE BUREAU OF MINES

VOL. XIX., PART II.

The Cobalt-Nickel Arsenides and Silver Deposits of Temiskaming

(Cobalt and Adjacent Areas)

BY

WILLET G. MILLER, Provincial Geologist

(FOURTH EDITION)

With an Appendix on—I. The Paleozoic Rocks of Lake Temiskaming
II. Profile from Toronto to the Hudson Bay Slope
III. "Early History of the Cobalt Industry in Saxony," translated by Geo. R. Mickle
IV. Mining and Concentrating Methods at Cobalt

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1913

"The detection of a small portion of cobalt in association with these metals upon the shores of Lake Huron, should lead us to look for deposits of this rare and valuable material."
—T. Sterry Hunt, in Report of Geological Survey of Canada for 1848-9.

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CONTENTS

PAGE

Preface to the Fourth Edition..XI.-XIV.

Chapter I.

Introduction 1
Situation and Discovery 1
Character and Origin of Cobalt Veins 5
Ores and Minerals 9
Order of Deposition of Minerals . 10
Notes on Minerals 13
Native silver 13
Native Bismuth 15
Graphite 15
Smaltite 15
Niccolite 15
Breithauptite 15
Chloanthite 16
Additional Notes on Arsenides 16
Analyses of Cobalt Hill Ore.. 17
Veinlets on Lake Shore 18
Cobalt Bloom or Erythrite 19
Annabergite 19
White Bloom 19
Argentite 20
Millerite 20
Cobaltite 20
Mispickel 20
Crystals of Mispickel 22
Proustite 24
Xanthoconite 24
Dyscrasite 24
Breithauptite 25
Pyrargyrite 25
Polybasite 25
Stephanite 25
Mixed Dark Mineral 26
Tetrahedrite 26
Matildite 28
Emplectite 28
Apatite 28
Quartz 28
Barite and Fluorite 28
Calcite and Dolomite 28
Manganiferous Carbonate 29
Aragonite 29
Bureau of Mines Specimens 30
Exhibit of Cobalt-silver Ores 32
Character of Cobalt Ores 33
Production of Cobalt Mines, 1904-1912 35
Mines, Concentrating and Refining Plants and Water Power 36
Dividends Declared and Paid by Silver-cobalt Mining Companies to end of 1912 37
High and Low Prices of Stocks of Cobalt-silver Mines 38
Silver Production of the World 38
Production of Silver in World since 1871 39
United States Silver Production . 39
Monthly Average Price of Silver. 40
Average Price of Bar Silver in London since 1833 40

PAGE

Cobalt 41
Arsenic, Production and Uses 41
Bismuth 43
The Rocks and Their Relationships 45
Age Relations of Rocks of Cobalt and Adjacent Areas 48
Maps and Sections 49
The Keewatin Complex 50
(1) Basalts 50
(2) Diabases and Other Basic Rocks 54
(3) Acid Intrusives 55
(4) Sediments 57
Relationships 58
Ores of the Keewatin 58
A Buried Iron Range 58
Iron Pyrites 59
The Keewatin-Laurentian Complex. 60
The Temiskaming Series 62
Structure 62
Relationships 62
Petrographic Characters 64
Midlothian Township 66
Temiskaming Series at Porcupine 66
Cobalt Series at Porcupine 69
Acid and Basic Intrusives into the Temiskaming Series 70
The Lorrain Granite 70
Lamprophyre and Other Basic Dikes 70
Distribution 70
Petrographic Character 71
Relation to Adjacent Formations 72
The Cobalt Series 73
Nomenclature in Former Editions of this Report 73
Inclusion of Lorrain Arkose and Quartzite with Cobalt Series .. 75
Erosion and Faulting 75
Composition of the Cobalt Series 76
Boulders Composed of Conglomerate 76
Order of Deposition 76
Thickness 78
Underlying Surface 79
Slate-like Greywacké 81
Thickness of the Greywacké 83
Chemical Composition of Greywacké 83
Analysis of Slate-like Greywacké 83
Analysis of Breccia 84
Columnar Structure 84
Quartzite 85
Conglomerate 85
Origin of the Conglomerate 85
Lorrain Arkose and Quartzite ... 89
The Nipissing Diabase 91
1. Structural Relations of the Sill 91
Section A, B, C, plate I. 91
Section D, E, F, plate I..... 91
Section G, H, plate II..... 93
Section K, J, plate II..... 93

PAGE

Section N, M, L, plate III..... 93
Section P, Q, plate III..... 93
General Section, upper half of Plate IV. 93
Ideal Restoration, lower half of Plate IV. 94
Section Y, Z, Plate V. 94
Section W, X, Plate VI. 96
Openings through which Diabase Ascended 96
Sills Elsewhere 98
2. Microscopical and Chemical Notes on the Diabase 98
Facies of the Diabase 103
Dikes of Aplite or Granophyre Younger than Nipissing Diabase 104
Analyses 104
Basic Dikes Younger than Nipissing Diabase 105
Later Basalt-Diabase of Cross-Lake, Cobalt 105
Analyses 106
Paleozoic 107
Silurian Limestone 107
Pleistocene 109
Glacial and Recent 109
Direction of Glacial Striæ 110
List of Glacial Striæ 111
Denudation and Deposition 112
Erosion in the District 112
The First Great Period of Erosion 113
Lorrain Granite Intrusion and Second Period of Erosion 113
Nipissing Diabase Intrusion and Third Period of Erosion 113
Erosion Since the Niagara Period (Fourth Period of Erosion) .. 114
Depth of Erosion 114
Climate in Past Ages 114
Economic Effects of Erosion 115
Regional Disturbances 116
N.W.-S.E. Water System 116
N.E.-S.W. System 118
Origin of the Systems 119
Age and Character of Faults 119
Economic Bearing of Faults 120
The Cobalt-Silver Veins 122
Fissures and Joints 122
Relation of Wall Rock to Ore .. 123
Secondary Disturbance of Veins. 123
Dimensions of the Veins 124
Former Vertical Extension of Veins 125
Richness of the Ore 125
Probable Total Number of Productive Veins 127
Distribution of Cobalt Ores in the District 129
Less Important Occurrences 129
Ore at Rabbit Lake 129
Other Silver Ores of the Region Surrounding Cobalt 130
On Lady Evelyn and Cross Lakes 131
Prospecting 132

CHAPTER II.

PAGE

The Outlying Cobalt-Silver Areas.. 133
South Lorrain Silver Area 133
Topography 133
Classification of Rocks 133
Glacial and Recent 135
Nipissing Diabase 136
Contact with the Cobalt Series 136
Cobalt Series 136
Rocks near Mouth of Montreal River 136
Greywacké 137
Quartzite and Arkose 138
Lorrain Granite 138
Keewatin 138
Keewatin, West of Point Fine 139
Discoveries 139
Wettlaufer 140
Bellellen 141
King George 141
Montrose 141
Sharp Lake 141
Keeley 141
Jowsey-Woods 142
Frontier 142
Townships of Casey and Harris ... 144
Casey Cobalt 144
Other Claims 144
Development Work 144
Geology 144
Classification According to Age 145
Post-Glacial 145
Glacial 145
Niagara 145
Nipissing Diabase 145
Cobalt Series 146
Laurentian Syenite 146
Contact of Laurentian and Cobalt Series 146
Keewatin 146
Recent Development at Casey Cobalt 147
Area South of Lake Wendigo 148
Character of the Country 148
Geology 148
Classification 148
Nipissing Diabase and Gabbro. 148
Cobalt Series 149
Keewatin 150
The Area West of Bay Lake on the Montreal River 151
Introduction 151
Rocks of the Area 151
Banded Slate 152
Quartzite 152
Nipissing Diabase and Gabbro. 152
Veins and Mineral Indications... 153
The Claims on Whitewater Lake. 153
Montreal River and Temagami Forest Reserve 154
Rocks of the Area 154
Relation Between Cobalt Series and Granite 157
Notes on Veins 158
Donaldson 160
Regal 160

PAGE
Moose Horn 160
Prudential 160
Beacon 160
White Reserve Mines 162
Mackenzie 162
Auld Township 162
The Gowganda Silver Area 165
Topography 168
Glaciation 168
Superficial Deposits 168
Rocks of the Area 168
Some Types of Keewatin 170
Dikes in the Keewatin 172
Crushed Syenite 172
Laurentian 173
Cobalt Series 174
Unconformity at the Base of the Cobalt Series 175
Unconformity in the Cobalt Series 176
Nipissing Diabase 177
Later Dikes 178
Some Dikes Cutting Davidson Lake Sill 178
Olivine Diabase Dike 179
Veins 179
Miller Lake-O'Brien 183
Mann Mines 183
Bartlett Mines 186
South Bay 186
The Shining Tree Silver Area 187
Location and Transportation 187
Topography 187
Geology 187
Character of the Veins 189
Mining Locations 190
The Seville Exploration Syndicate 190
Turnbull's Claims 190
E. L. Greave's Claims 191
Caswell-Eplett Claims 191
Archibald's Claims 191
Nelland's Claim 191
Nellie Lake Syndicate 191
The McIntosh Mines, Ltd. 192
The Darby Claims 192
L. O. Hedlund's Claims 193
The Exploration Syndicate of Ontario 193
Florence Lake, Shining Tree and Rosie Creek Areas 194
Shining Tree Area 194
Rosie Creek Area 194
Township of Langmuir, Porcupine Area 195
Otter Township 196
Occurrence of Cobaltite and Native Bismuth 196

PAGE
CHAPTER III.
1. Lake Superior Silver Deposits . 197
The Port Arthur Mines 197
Silver Islet Mine 201
Ores of other Lake Superior Mines 202
Rabbit Mountain Group 204
Minerals of Port Arthur Veins. 205
Spar Island Vein 206
Production of Port Arthur Area 208
Michipicoten Island 209
2. Other Canadian Nickel-Cobalt Ores 211
3. Foreign Cobalt Deposits 213
Cobalt, Annaberg and Schneeberg Compared 216
Chalanches, France 220
The Ore Deposits 221
Norway 222
New Caledonia 222
New South Wales 225
South Australia 225
South Africa 225
United States 226
Mexico 226
Chili 227
4. Metallurgy 227

APPENDIX I.
The Paleozoic Rocks of Lake Temiskaming 228
Silurian 228
Clinton and Niagara 228
Wabis Bay 229
Haileybury 229
Percy or Farr Island 229
Chief's Island 230
Piché Point 230
Mann Island and Dawson Point. 231

APPENDIX II.
Profile from Toronto to Hudson Bay Slope 233

APPENDIX III.
The Early History of the Cobalt Industry in Saxony 234-251

APPENDIX IV.
Mining and Concentrating Methods at Cobalt 253
Mining Methods 253
Power Development 255
Concentration 255
Smelting 257
Accidents and Labour 259
Explosives 261
Index 262

ILLUSTRATIONS

FIG.		PAGE
1.	*Frontispiece.* Little Silver Cliff, Nipissing mine.	
2.	Cobalt station, June, 1905	xiv.
3.	View of part of Cobalt, December, 1905	xv.
4.	Cobalt in 1907, with Cobalt lake in the foreground	xvi.
5.	Pre-Cambrian of North America	xviii.
6.	Map published in 1744	4
7.	Generalized vertical section through the productive part of the Cobalt area	5
	Index map showing mining properties at Cobalt	6-7
8.	Polished surface of ore from La Rose mine	11
8*a*.	Native silver	11
9.	Native silver in calcite	14
10.	Native silver	14
11.	Spheroidal intergrowth of smaltite and calcite	15
12.	Cobalt Hill vein	16
13.	Smaltite crystals	18
14.	Crystals of mispickel	21
15.	Crystals of mispickel	23
16.	Pyrargyrite crystal	25
17.	Stephanite crystal	27
18.	Slabs of silver from Trethewey mine	30
19.	Coniagas sample	31
20.	Keewatin, Cobalt series and Nipissing diabase	44
21.	Index map of Cobalt-Porcupine-Sudbury region	47
22.	Lang street, Cobalt, September, 1911	49
23.	Ellipsoidal basalt	51
24.	Weathered surface of Keewatin	53
25.	Torsion cracks in Keewatin greenstone	55
26.	Part of rock surface in Fig. 25, enlarged	56
26*a*.	Kerr Lake mine, Cobalt	59
27.	Beds of conglomerate, Rabbit lake	61
28.	Map showing distribution of rocks in part of the township of Bucke	63
29.	Temiskaming series, with vertical dip near shore of lake Temiskaming	65
30.	Temiskaming in Midlothian township	67
31.	Section of Temiskaming series, township of Whitney	68
32.	Temiskaming series, North Dome mine, Porcupine	69
33.	Photomicrograph of hornblende-lamprophyre	71
34.	Coarse boulder conglomerate of the Cobalt series	74
35.	Boulder of conglomerate of the Temiskaming series in Cobalt series	77
36.	Contact, Keewatin and Cobalt series, on shore of Temiskaming	79
37.	Photomicrograph of greywacké of Cobalt series	80
38.	Fragments of slate-like greywacké cemented by arkose	81
39.	Slate-like greywacké of the Cobalt series	82
40.	Columnar jointing in slate-like greywacké	84
41.	Boulder conglomerate, Cobalt series, Drummond mine	86
42.	Coarse boulder conglomerate of the Cobalt series	88
42*a*.	Prospectors at Cobalt, May, 1904	89
43.	Nipissing diabase, west face of Mount Diabase	95
	Plate III to face page	93
	Plate I " "	90
	Plate II " "	92
	Plate VI " "	96
	Plate V " "	97
44.	Photomicrograph of quartz-diabase	100
45.	Photomicrograph of quartz-diabase	101
46.	Jointing planes in diabase	102
46*a*.	Good roads at Cobalt	106
47.	Holy Cross Cathedral, Haileybury	107
48.	Contact of quartzite of the Cobalt series with Niagara limestone	108
49.	Bedded clay in railway cut	109
50.	A part of the face of the cut shown in Fig. 49 enlarged	110

FIG.		PAGE
51.	Relations of lines of Regional Disturbance to Cobalt Silver Deposits	117
52.	A typical silver-cobalt vein outcrop on the Coniagas	122
53.	An underground view in La Rose, showing parallel veins	124
54.	Carson vein on Crown Reserve property	126
54*a*.	Three veins in light colored boulder of granite, Trethewey mine	128
55.	Part of surface of ore body at Wright mine	130
55*a*.	Canadian Bank of Commerce, Cobalt, July, 1905	131
56.	Trenches through loose deposits to compact rock	133
57.	Map of Cobalt and outlying silver-cobalt areas	134
58.	Overlooking lake Temiskaming from South Lorrain	135
59.	The Notch, near mouth of Montreal river	137
60.	A vein showing in pit on Wettlaufer property	140
61.	Old timber road, South Lorrain	143
62.	Area south of lake Wendigo	149
62*a*.	Physician's office, Cobalt, July, 1905	150
63.	Area adjacent to Elk lake, Montreal river	155
64.	Looking southwest from the top of Maple mountain	156
65.	A stretch of Montreal river, Elk lake	159
66.	A group at Elk lake, October, 1907	161
67.	Elk city, James township, 1907	163
68.	Prospectors with outfit, Montreal river, March, 1907	163
69.	The post office, Gowganda, 1909	165
70.	Map of Gowganda silver area	166
71.	South end of Long Point lake	167
72.	Dog team on Gowganda lake	167
73.	View from high hill to the northeast of Obushkong lake	169
74.	Bridal Veil falls	169
75.	Keewatin intruded by diabase, Everett lake	171
76.	Iron formation intruded by quartz-porphyry	172
77.	Contact of Laurentian and Cobalt series, Bloom lake	173
78.	Banded slaty greywacké overlain by brecciated greywacké	174
79.	Basal conglomerate, Cobalt series, overlying granite, Obushkong lake	175
80.	Unconformity between greywacké conglomerate and arkose, Obushkong lake	176
81.	Greywacké of the Cobalt series underlain by Nipissing diabase	177
82.	Contact of slate of Cobalt series and Nipissing diabase, Bulsch lake	179
83.	Granite intruded by diabase, Bloom lake	180
84.	Trench, showing fissuring in diabase, Gowganda lake	181
85.	Millerett mine, showing stamp mill	182
86.	Camp, Millerett mine	183
87.	Miller Lake-O'Brien mine	184
88.	No. 2 shaft, Mann mine	185
89.	Agglomerate, Spider lake, Leonard township	188
90.	Folded sedimentary rocks, Herron lake	189
91.	Folded sedimentary rocks, Herron lake	189
92.	Camps of the McIntosh Mines, Limited, Spider lake	192
93.	Camp of Exploration Syndicate of Ontario at Treacey lake	193
94.	Barite vein, Langmuir township	195
95.	Key plan, north shore Lake Superior	198
96.	Section through Mount McKay, Fort William	199
97.	Mill at the Beaver mine	200
98.	Kakabeka Falls	200
99.	Silver Islet	202
100.	Silver Islet main shaft of mine	203
101.	A miner of Silver Islet	204
102.	Silver Islet, main shaft and office	205
103.	Table hill, illustrating structure	206
104.	Spar Island vein	207
105.	Top of diabase sill, showing contraction dikelets	208
105*a*.	Forest fire on east side of Cobalt lake	210
105*b*.	Cobbing and sacking ore at La Rose mine, November, 1904	212
106.	Vertical section, Joachimsthal	213
107.	Map of part of the Annaberg area, Saxony	215
108.	Map of part of Schneeberg area, Saxony	217
	Profile, Toronto to James Bay slope	233
109.	Coniagas concentrator and shaft house	252
110.	General flow sheet, Cobalt concentrators	254

FIG. PAGE
111. O'Brien concentrator, Cobalt 256
112. McKinley-Darragh mill and shaft house, Cobalt..... 256
113. Crown Reserve mine, Cobalt 258
114. La Rose main vein, 1905 258
115. Trethewey vein and discovery post, May, 1904..... 260
116. Underground view at La Rose mine, 1905..... 260

MAPS AND SECTIONS

Colored geological map of cobalt-nickel-arsenic-silver area, near lake Temiskaming, scale 1 mile to 1 inch.

Uncolored index map of part of the Cobalt area, showing veins and position of lines of sections, scale 800 feet to 1 inch.

Map of the Gowganda area, scale 1 mile to 1 inch.

Uncolored geological sketch map of the township of Leonard.

Geologically colored cross sections, horizontal scale, 800 feet to 1 inch.

Maps and sections in the text—Figs. 5, 6, 7, 21, 28, 30, 31, 32, 36, 51, 57, 62, 63, 70, 95, 96, 106, 108

PREFACE TO THE FOURTH EDITION

The third edition of this report, published in May, 1908, has been out of print for some time. Owing to the rapid development of the mineral industry in the newer districts of the Province, necessitating the preparation of geological maps and reports on several virgin areas, the publication of the fourth edition has been delayed. Moreover, it was felt that in so far as the economic geology of the Cobalt area is concerned, there is little to add to the descriptions that were given in former editions of the report. Some features have been treated more fully in this edition, underground work in the mines having furnished many details concerning the structural relations and the character of the veins. Advantage has been taken of this information to prepare several cross-sections and other illustrations, which it is hoped will add interest to the report.

As regards its production, the area is unique. It is not only the world's greatest producer of silver, but it absolutely controls the market for cobalt, has a large output of arsenic, and is among the three or four areas that have the largest output of nickel.

Owing to its accessibility, its proximity to the great centres of populations of eastern North America, the large number of producing properties, the huge capitalization of the companies, the comparative uniqueness of its ore bodies, and the difference of the geology from that of most precious metal mining areas, it is safe to say that Cobalt has been visited and studied by more mining engineers and geologists than any other mineral area in the same length of time.

In so far as the geology is concerned, Cobalt has served as a key area for a large district. Previous to the beginning of our field work in 1904, the Keewatin and Huronian in this part of Ontario and the adjacent part of Quebec were thought to belong to one series. The Keewatin had been mapped as Huronian. Our first report showed that the two series are different in origin, and that they are separated by a great unconformity. Work that has since been done by the Geological Survey of Canada on the Quebec side of lake Temiskaming and farther north and west, and that done by our own parties in the Elk Lake, Gowganda, Porcupine and other areas has shown that the geology of the whole region is similar to that of Cobalt. Any person having a good knowledge of the geology of the Cobalt area has little difficulty in mapping other areas in this region.

Maps

The colored geological map of Cobalt, on a scale of one mile to the inch, which has gone through three editions, besides being reprinted two or three times, was revised and enlarged, under the direction of Mr. James Bartlett, and published in 1910. It accompanies this edition of the report. The enlarged map covers all of the Gillies timber limit, the South Lorrain area and part of the township of Casey and adjacent tracts at the head of lake Temiskaming. In this territory, Casey and South Lorrain have been found to contain the only producers of silver outside of the Cobalt area proper, which may be considered to include the townships of Coleman, Bucke, Lorrain, and the Gillies limit. The routes of the hydraulic and the hydro-electric power lines and other features have been added to this edition of the map.

There also accompanies this report a revised edition of the uncolored map, on a scale of 800 feet to the inch, of the area in the immediate vicinity of Cobalt. It shows the names of the properties, the productive veins, the position of the lines of sections and so forth.

A colored geological map of the Gowganda area, on a scale of one mile to one inch, has been published.

The Bureau still has a supply of the large scale, geologically colored map for distribution. This map was published with the third edition of the report It is on a scale of 400 feet to the inch, with contour intervals of 10 feet.

The geological map of the Elk Lake and Montreal River areas, scale one mile to one inch, that accompanied the third edition is out of print.

Sections

Underground work in the mines has made it possible to prepare more complete vertical sections illustrative of the structural relations of the three great groups of rocks—the Keewatin, the Cobalt series and the Nipissing diabase. While these sections furnish more detailed information concerning the structural relations of the rocks, they do not introduce any new principles. During our field work, in 1904, the discovery was made that the diabase is in the form of a sill, which intrudes both the Keewatin and the Cobalt series, and that the rocks overlying the diabase, the upper wall, have been removed over the greater part of the productive area by erosive agencies. Most of the veins which have been, or are being, worked at Cobalt lie below the sill, or rather below the eroded parts of it. Doubtless the veins or parts of veins enclosed in the now, for the most part, eroded upper wall of the sill were more extensive than those lying below it. The geological sections accompanying this report show the relation of the sill to the other rocks and the position of the veins.

Title of Report

The title "Cobalt-Nickel Arsenides and Silver of Temiskaming" has been retained for this edition in preference to the name Cobalt, which is commonly applied to the area. The title is essentially that given to the first paper on the mineral deposits written at the end of 1903, and published in the *Engineering and Mining Journal*, of New York, Dec. 10th, 1903. It has been thought best to retain the same title for the various editions in order to prevent confusion in the literature.

Markets and Refining

During the first two or three years, practically all of the ore was shipped out of the country in the crude state. Most of the ore is now refined in Ontario, a considerable part of the silver being shipped in the refined state from Cobalt. Plants in other parts of the Province not only produce refined silver from the Cobalt ores, but they also have a large output of white arsenic, and are producers of cobalt and nickel oxides.

Mines, Concentration and Power Plants

Since the underground work in mines and the plants of the Cobalt silver areas are described in Part I. of the annual reports of the Bureau of Mines, and in Mr. A. A. Cole's annual reports to the Temiskaming and Northern Ontario Railway Commission, it is not considered necessary to repeat the descriptions in this report. However, in Appendix IV., a summarized description is given of mining and concentrating methods employed in the silver areas. This description is by Mr. E. T. Corkill.

Production and Dividends

Outside of the Cobalt area proper, in the township of Coleman and the Gillies timber limit, the chief producers of silver are the Casey Cobalt, the Wettlaufer mine, in South Lorrain, and the Millerett, the Mann, and Miller Lake-O'Brien, in the Gowganda area. Small shipments have been made from the Elk Lake area, from the vicinity of Maple mountain, in the township of Whitson, and, at an earlier date, from a part of the township of Bucke, in the vicinity of lake Temiskaming. The index maps, pages 47 and 117, show the situation of the various areas mentioned.

For the whole period, up to the end of 1912, since the mines were opened, Cobalt has produced 155,815,839 ounces of silver, the value being $81,731,115; the quantity of

cobalt, nickel and arsenic is known only approximately. Statistics are given on a following page. Up to the end of the year, the total dividends distributed amounted to $39,834,740, not including the profits made by two or three mines, either privately owned or close corporations. The dividends have been equal to approximately fifty per cent. of the output.

Profits from Railway Building

By the time this report is through the press, the dividends distributed by Cobalt mines will amount to about $45,000,000. The construction of the Temiskaming and Northern Ontario railway, together with equipment, has cost the Province approximately $18,500,000. As the building of the railway led to the discovery of the mineral deposits of Cobalt, it will be agreed that the railway was a profitable undertaking for the people. In addition to the sum distributed directly as profits, the Cobalt area has produced approximately another $45,000,000 or more, which has been expended in the Province for labor, food supplies, machinery and other materials. Moreover, the people, as represented by the government, have received four or five million dollars in cash from Cobalt through the sale of lands, from royalties, fees and otherwise, and had it not been for the mines, the railway would have been run at a heavy loss.

Cobalt has not only paid for the railway twice over, but the people have in the railway, now that it is connected with the National Transcontinental, a valuable property which enhances the value of the agricultural lands and timber limits tributary to it, and offers an incentive to the opening of mineral areas such as Porcupine.

It may be added that Cobalt has not only brought great profit to the Province of Ontario, but it has established faith in the mineral resources of the great pre-Cambrian regions, which occupy fully one-half of the surface of Canada. Lying on the southern point of these regions, it offers encouragement to the prospecting of the vast, and little known, territories of the hinterland.

It may not be out of place to refer to the preface to the second edition of this report concerning the benefits and injuries derived from the discovery of the Cobalt deposits. This introduction was written in February, 1906. The feared "mining on paper" began with the "boom" in August of the same year. While the public undoubtedly lost much money in foolish gambling in stocks, almost innumerable worthless properties being put on the market and many of the best mines being over-capitalized, the mineral industry is not to blame. Mining is as safe as any other industry, if ordinary precautions are taken. No part of the world, possessing virgin mineral areas, is as well situated for the securing of capital for mining enterprises as is Ontario and adjacent parts of Canada. Eastern North America contains a population of over fifty million people, with great wealth and with the characteristic of being willing "to take a chance." Our mineral areas can be said to be at the back door of this population. It is not surprising that almost every mining boom is carried to extremes.

Acknowledgments

The author desires to express his most sincere thanks to the prospectors, mine operators and other men, who are, or have been, connected with the development of the Cobalt area, for the kindness which he has received at their hands, and for the assistance in the study of the area, which they have always extended to him. The study has been interesting and the association with the men of the area will always remain a cherished memory.

It is with much pleasure that the author acknowledges the valuable assistance that has been so cordially given to him by members of the staff of the Bureau of Mines. During the last four or five years, since the publication of the third edition of the report, owing to the widespread mining activities in Ontario, a province that now has an area nearly three and a half times as great as the British Isles and about twice that of France or Germany, it has been possible to give attention to Cobalt only at irregular intervals. Thanks are especially due to Mr. Cyril W. Knight, Assistant Pro-

vincial Geologist, for his hearty co-operation, and the kindly interest he has taken in the work. Mr. E. T. Corkill, Chief Inspector of Mines, has furnished much useful information. The work of Mr. A. G. Burrows on the outlying cobalt-silver areas has been of much service. Mr. W. R. Rogers has rendered valuable assistance in the preparation of the report, as have several assistants who have been associated with the staff during shorter periods. Most of the chemical work made use of in the report has been performed by Messrs. A. G. Burrows, N. L. Turner and W. K. McNeill.

Toronto, May, 1913. W. G. M.

Fig. 2.—Cobalt Station, June, 1905.

Fig. 3.—View of part of Cobalt, showing railway station and hotel, December, 1905.

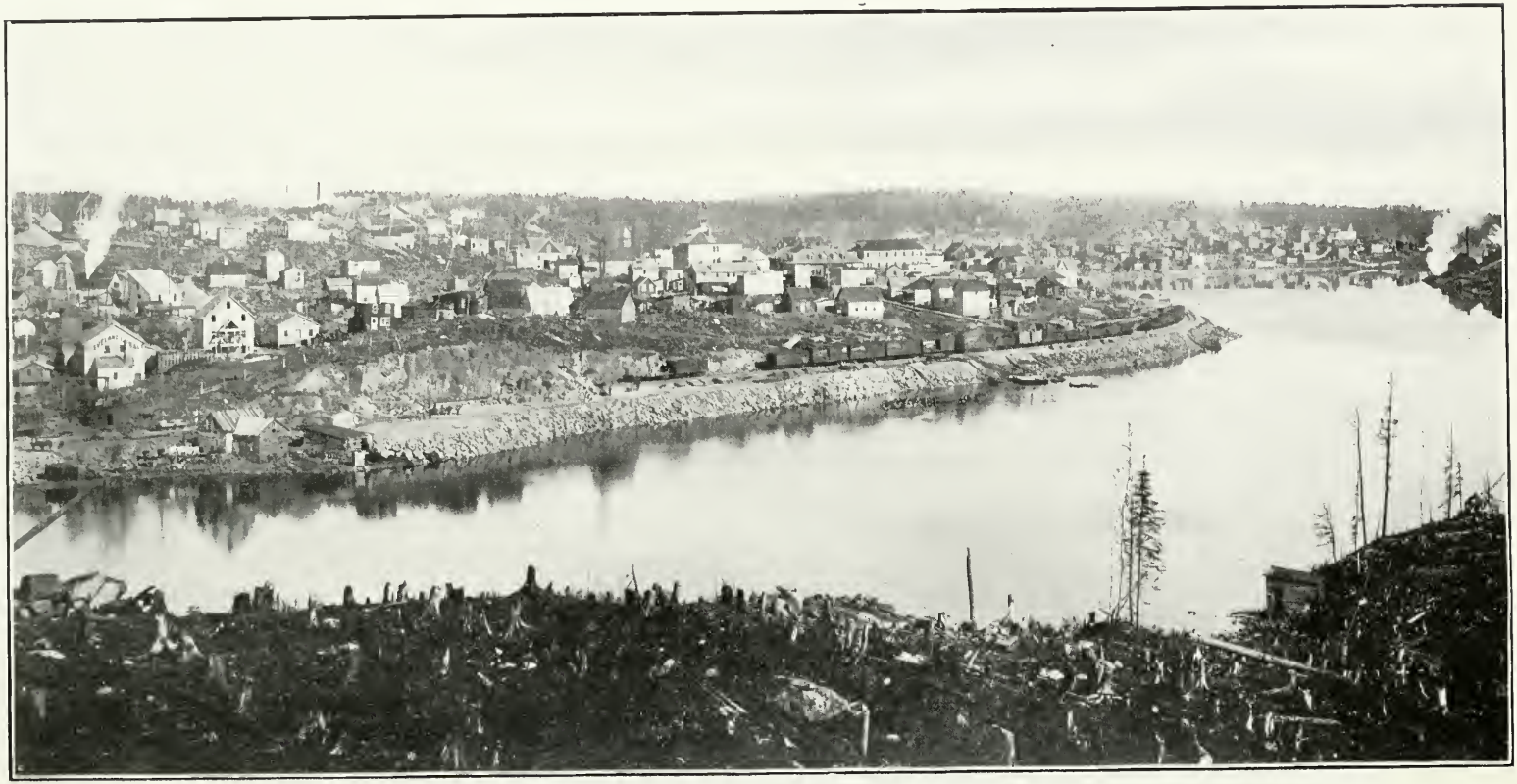


Fig. 4.—Cobalt in 1907, with Cobalt Lake in the foreground.

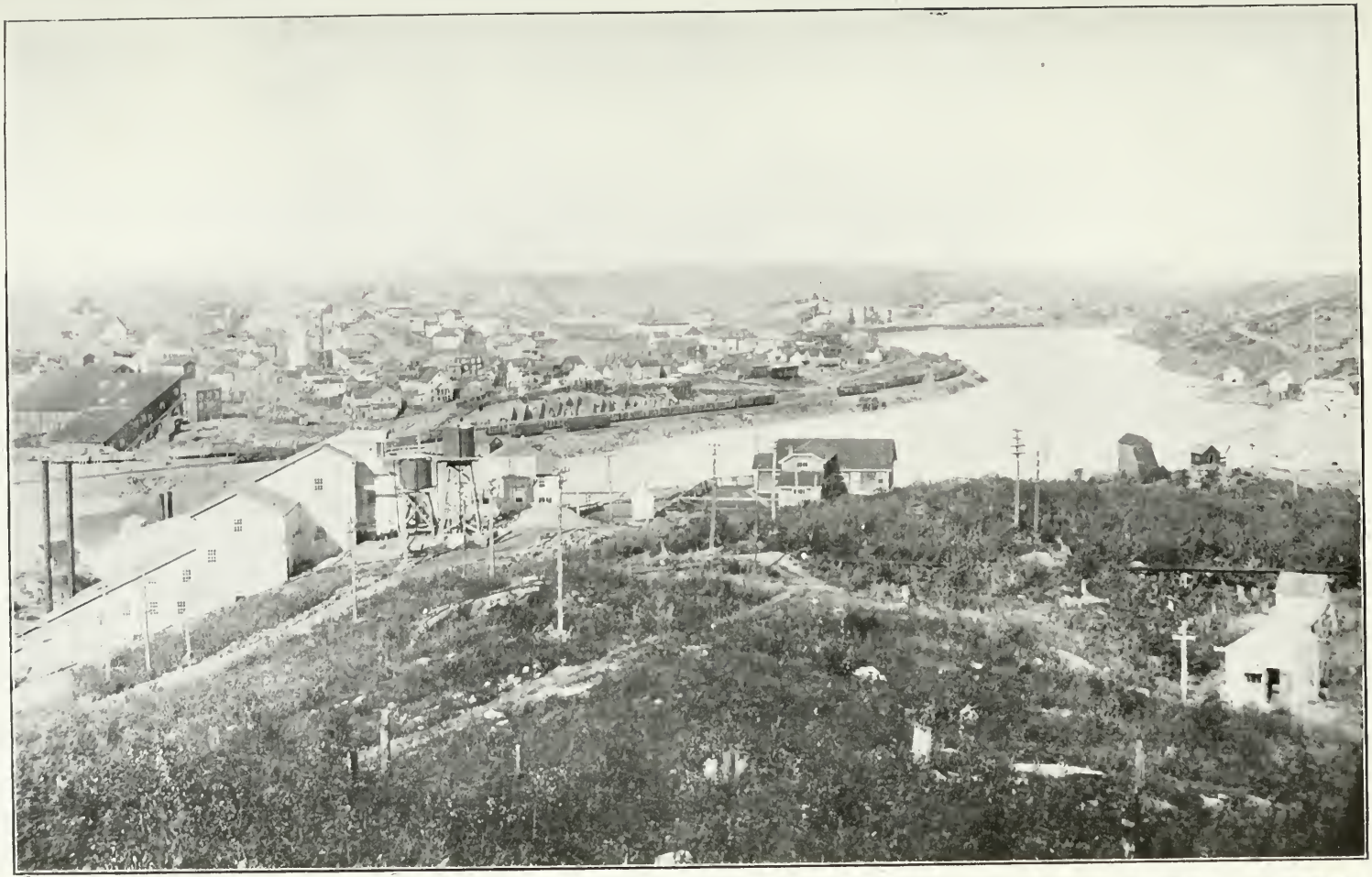


Fig. 4a.—General view of Cobalt Lake and Town, September, 1911.

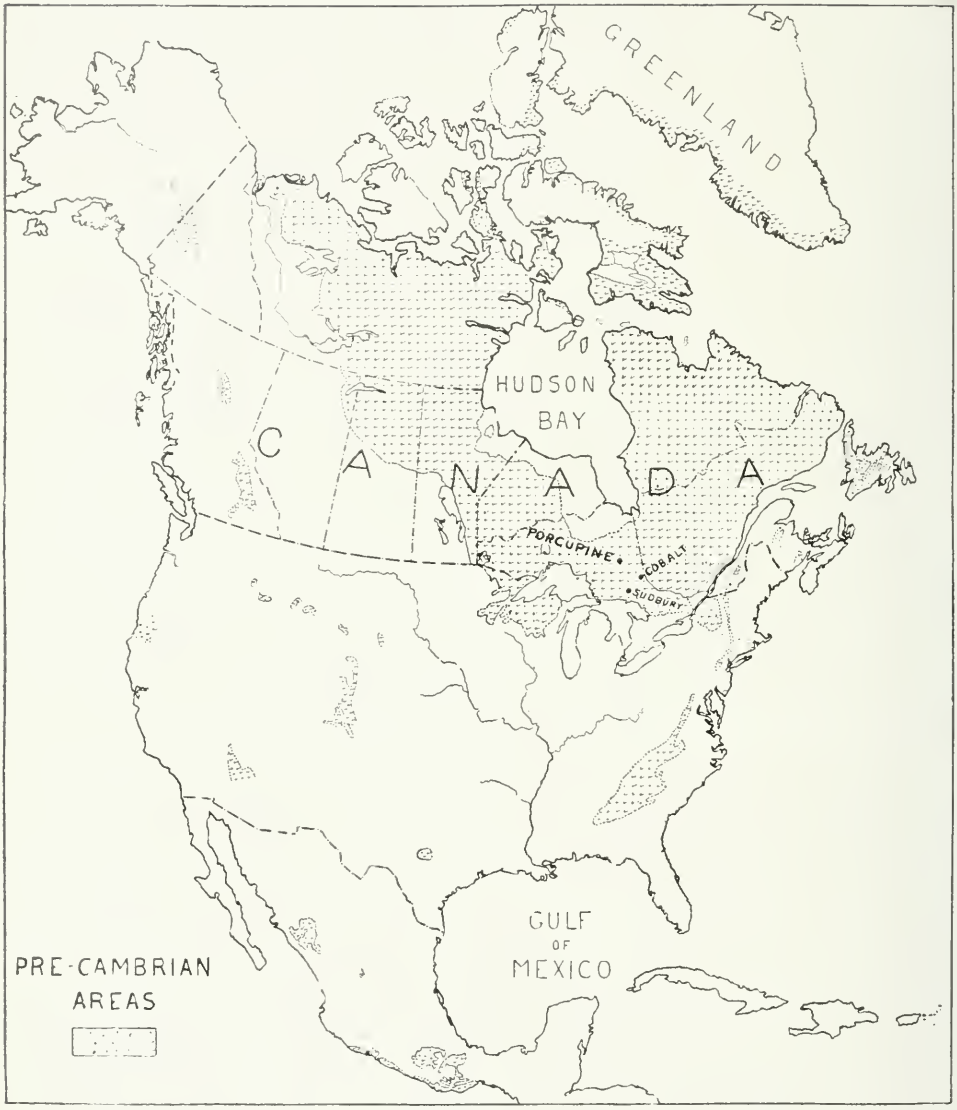


Fig. 5.—Pre-Cambrian of North America, showing situation of Cobalt.

Cobalt-Nickel Arsenides and Silver

(Cobalt and Adjacent Areas)

By WILLET G. MILLER

CHAPTER I

Introduction

The protaxis, or that rugged, rocky, pre-Cambrian region which stretches away from the St. Lawrence river, expanding to the northwestward, and occupying a large part of northern Ontario, has produced, and is constantly producing, a group of what may be called unique, or at least comparatively rare, economic minerals. Probably as great a variety of minerals is produced here in proportion to the number of inhabitants as is derived from any other country. Among the economic deposits are:

The nickel-copper mines of Sudbury, which is the greatest nickel producing locality of the world, with the by-products, platinum and palladium;

The gold deposits of Porcupine and other northern areas;

The corundum deposits of north Hastings, south Renfrew and other areas in eastern Ontario, which now supply by far the greater part of the corundum consumed in the world;

The unsurpassed feldspar and mica deposits of Frontenac and adjoining counties and the apatite, graphite, pyrite, talc, gold, copper, zinc, lead, fluorite and barite of the same district;

The iron ranges, which extend over a great territory in northern and northwestern Ontario, but which, up to the present, have not been developed to a great extent;

In addition to these, it may be said that a few years ago north Hastings possessed the only arsenic plant in North America. More recently the auriferous-arsenic ores of Temagami were made known, and lastly discovery was made of the series of Cobalt-Nickel Arsenides and Silver, which is unique, so far as known, on this continent, and is paralleled by deposits only in Saxony and adjacent regions of continental Europe.

The southeastern part of this region is also noted for certain minerals which can scarcely be said to be of economic value, but are of great scientific interest. The largest and finest crystals of the mineral zircon in the museums of the world come from eastern Ontario, as do also sphenes, pyroxenes, scapolites and other crystals. Sodalite, marble and other decorative materials are also found here.

The situation of Cobalt in the protaxis, or pre-Cambrian regions, will be seen from the accompanying sketch map of North America (Fig. 5). A profile from Toronto, on Lake Ontario, to the James Bay slope shows that the protaxis is not such a distinct "height of land" as it is usually described to be (Appendix II). It is only since the completion of the Temiskaming and Northern Ontario Railway that such a profile could be prepared.

Situation and Discovery

A brief description of the character and modes of occurrence of the Cobalt-Silver ores of the area is given, as marginal notes, on the colored geological map which accompanies this report. For practical purposes, it is not necessary to add much to these. In the report which was published in the Thirteenth annual volume of the Bureau of Mines an account of the discovery and location of the ore bodies was given. It may be well to repeat briefly some of this information.

These ore bodies, which carry values in silver, cobalt, nickel and arsenic, were discovered during the building of the Temiskaming and Northern Ontario Railway. In fact, it may be said that the railway discovered the deposits, as it runs almost over the top of one of the most important veins.[1] The finding of such rich ore within so short a distance of the shore of lake Temiskaming, a stretch of water which has been a well-travelled route to the north by white men for 200 years or more, and the deposits being only about four miles from the town of Haileybury, show the possibilities there are for the discovery of important mineral-bearing areas in the vast hinterland of Ontario, much of which is little known.[2] The first of these ore bodies to be worked lies within half a mile of what is now known as Cobalt station, distant by rail 103 miles from North Bay junction on the transcontinental line of the Canadian Pacific, and 330 miles almost north of the city of Toronto.[3] It may also be added that one of the oldest known ore bodies in North America, the argentiferous galena on the east side of lake Temiskaming, is distant only 8 or 9 miles from Cobalt station. This galena deposit was apparently discovered by voyageurs over 150 years ago. A map of the lake published in 1744 has a bay marked on it with the name "Ance à la Mine," thus showing that the deposit was known at least at that date, and probably much earlier, owing to the

1 It may be added that the Canadian Pacific railway virtually discovered the Sudbury nickel deposits, 90 miles to the southwest of Cobalt. It can thus be said that each of the two railways in this part of Ontario brought to light an important and little dreamed of mineral field.

A FORECAST.

It may be interesting to note that the writer made the following comment on the mineral possibilities of the district in a report over two years before the discovery of the cobalt deposit:—

"It will be seen from what has been stated on preceding pages that the district examined contains as great a variety of rocks as probably any part of the Province of equal area. . . .

"Although few discoveries of economic minerals have been made in this territory, it may reasonably be expected, judging from the character and the variety of the rocks, that deposits of value will be found when the district is more carefully prospected, as it will be in a short time, owing to the rapid settlement which is now taking place. . . . It would seem that at least some of the conditions of the Sudbury district are repeated in this more eastern field." (Report on "Lake Temiskaming to the Height of Land" in the Eleventh Report of the Bureau of Mines, page 229.) This report gives an account of the rocks and of the canoe routes from Lake Temiskaming northward to the Height of Land.

2 At an early date French fur traders penetrated the district surrounding Lake Temiskaming and the Upper Ottawa. Delisle's map of 1703 shows that the French had a post on the river Abitibi, to the northeast of the head of Lake Temiskaming. Champlain's map, 1632, has a rude outline of the Ottawa river above its junction with the Mattawa.

3. The name Cobalt appears to come from the German Kobold, meaning goblin or house spirit. The metal was so called by the miners because its ore, being arsenious, was poisonous and difficult to treat. The writer felt, however, when he suggested the name for the town, that in this age such a name would not be considered unlucky.

THE CHRISTENING OF THE TOWN OF COBALT.

Fearing that the name "Long Lake," which had been in use for the construction camp, would be retained for the station which it had been decided to place at this point on the railway, the writer endeavored to select a name which would be in keeping with the locality. As an experiment he put up a post, in the first week of June, 1904, on the railway near the lake, and wrote on a piece of board attached to the post, "Cobalt Station, T. & N. O. Ry." The name took at once, as was seen when the writer visited Haileybury a few days afterwards. The workmen and others from Long Lake who had registered at the hotel meantime had all given their addresses as "Cobalt."

On the 7th of June, 1904, the writer wrote to Mr. T. W. Gibson, Director of the Bureau of mines, concerning the name of the station.

EXTRACT FROM LETTER FROM W. G. MILLER TO T. W. GIBSON.

"I wish you would suggest to the Commissioners of the T. & N. O. Ry., or whoever has the naming of the stations along the line, that they call this station at Long Lake, Cobalt Station." "There will be a post office here in time—there are enough people here for one already—and there is now a Long Lake post office in Frontenac County. The name 'Cobalt' would be unique. It would serve to advertise the place, and miners and others would not get mixed in their stopping off place, as they might if the station is simply called 'Long Lake.'"

On June 11th, Mr. Gibson wrote to the Secretary of the Railway Commission, Mr. P. A. Ryan, concerning the calling of the station "Cobalt." Two days afterwards, on June 13th, Mr. Ryan wrote as follows to Mr. Gibson:

"I beg to acknowledge receipt of your favor of the 11th inst., suggesting that the station which will probably be established at Long Lake, south of the Township of Bucke, be called 'Cobalt.' The suggestion which you make strikes me as being a good one, and I shall have pleasure in bringing your letter before the Commission at the proper time."

Shortly after the receipt of Mr. Ryan's letter the Commissioners met and accepted the name "Cobalt" for the station, which is now known throughout the world.

fact that the ore outcrops at the water's edge and is of such a character as to attract attention (Figs. 6, 55).

Some of these veins in the vicinity of Cobalt station were apparently noticed by the men employed in railway construction in the spring of 1903, but, there being no miners or prospectors among them, little interest was aroused and nothing was heard of the discovery by prospectors till October of the same year. At that time Mr. T. W. Gibson, Director of the Bureau of Mines, then in that part of the Province, was given a sample of niccolite which the donor thought was copper ore, the color of this mineral being like that of copper as the German name, kupfer-nickel, indicates. Mr. Gibson, however, recognized the value of the sample and forwarded it to the writer, who was then in the eastern part of the Province, and asked him to make a report on the occurrence as soon as possible. The writer, although he knew the specimen represented high class ore, hardly expected to find ores of the character and in the quantity which he saw on his arrival.[4] This mineral, niccolite, had been found some years before in association with the lower grade nickel ores of some of the Sudbury deposits, but no great quantity of it has up to the present been discovered in the Sudbury field, the town of which name lies about 90 miles southwest of Cobalt station. It may, however, be stated that the Sudbury ore deposits are quite different in character and in origin from those at Cobalt, although the metal nickel is an economic constituent in each.

The Sudbury deposits have received a great deal of attention from geologists during the last fifteen years or more, and two important reports have been published on them. These are by Dr. A. E. Barlow, for the Geological Survey, and by Professor A. P. Coleman for this Bureau.[5] Nearly all the writers agree that the ores are essentially of igneous origin—that is, that the nickeliferous magnetic pyrites or pyrrhotite and copper pyrites have separated from a molten mass of rock.

4 At the time of the writer's arrival in the district, in November, 1903, 4 veins, all of which were very rich, had been found. Three of these were within sight of the railway, and the fourth was a short distance to the southeast. The blackened, tarnished silver had up to that time attracted little or no attention, although it occurred in profusion in two or three of the weathered outcrops. At the present time about 115 veins, that may be considered important producers, have been found. Although the writer's first report of his examination of this cobalt-silver area was published in November, 1903, the public evinced little interest in the field until about eighteen months afterwards, when reports were made of shipments from various properties. The lack of interest was apparently due to the fact that the evil effects of the mining boom of a few years previous had not died out, and the public were more or less sceptical of reports on mining, no matter from what source they might emanate. By June, 1905, interest was aroused in the district throughout North America, and the rush to Cobalt has been greater than has been seen before in the mining fields of Ontario.

The following extracts from letters written in the autumn of 1903, by Mr. T. W. Gibson, Director of the Bureau of Mines, may now have some historical interest.

(Extract from letter from T. W. Gibson to W. G. Miller, then inspecting mineral propertes in the vicinity of Perth, Ontario.)

Bureau of Mines, Toronto, Oct. 26th, 1903.

"I am enclosing herewith a fragment of a larger sample of what I take to be kupernickel, found along the line of the Temiskaming & Northern Ontario Railroad. The locality of the deposit is in the unsurveyed territory immediately south of the township of Bucke. I have not learned anything as to the extent of the discovery, but if the deposit is of any considerable size it will be a valuable one on account of the high percentage of nickel which this mineral contains. I think it will be almost worth your while to pay a visit to the locality of the discovery before navigation closes. I am under the impression that the find was made while making the cutting for the railway. Mr. Ferland, of Haileybury, showed me a sample of the mineral when I was there, but he did not appear to recognize it or know its value, deeming it a compound of copper. It would be rather remarkable should our nickel deposits turn out to have a wider range than has hitherto been supposed, and especially if the new outcrop should be a large one, containing ore of so high a grade."

(Extract from letter from T. W. Gibson to W. G. Miller, addressed in Haileybury.)

Bureau of Mines, Toronto, Nov. 13th, 1903.

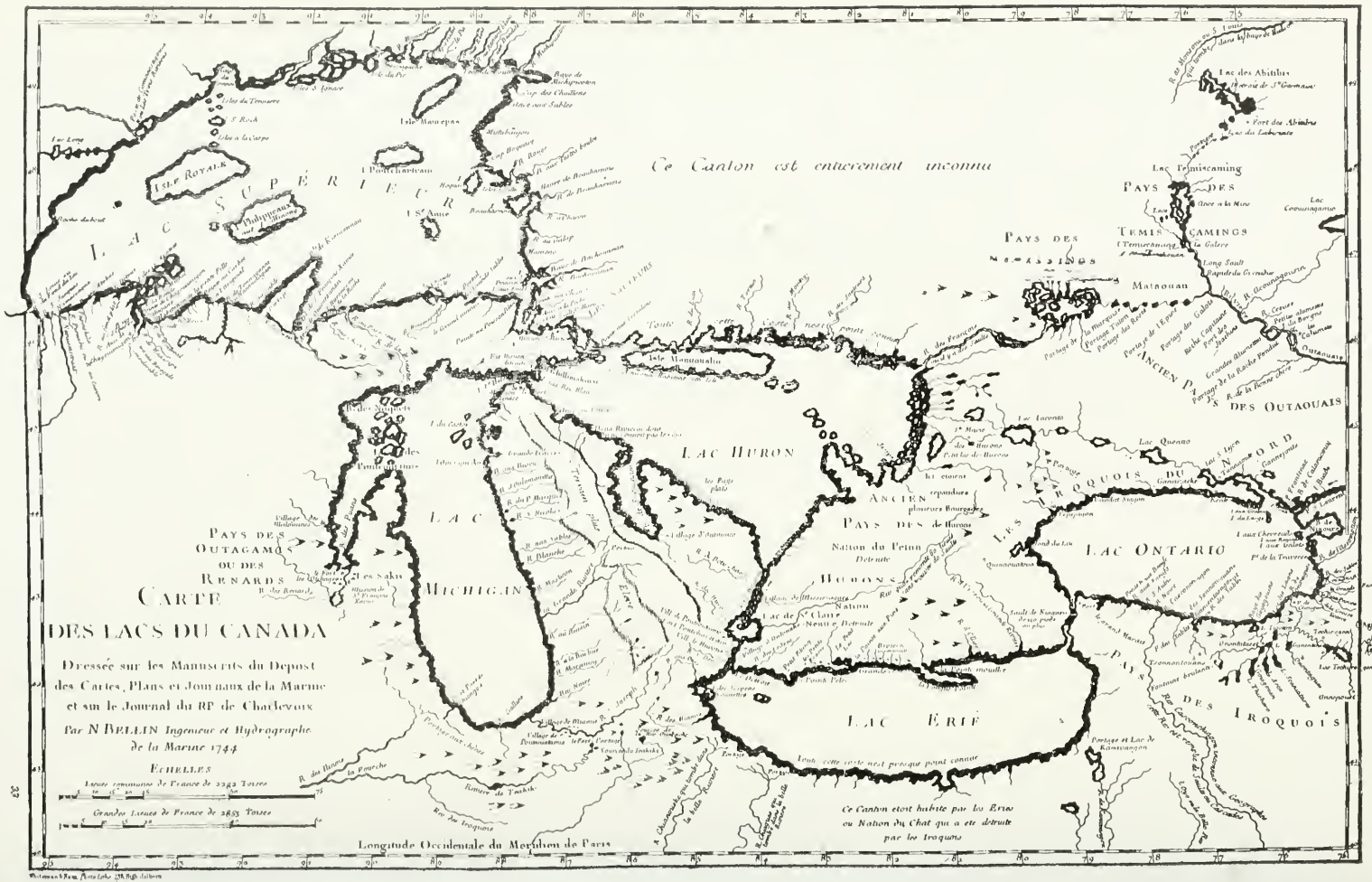
"I duly received your letters of the 6th and 9th inst., respecting the progress you are making in looking up the really wonderful finds which appear to have been made in the locality where you are. I hope you will be able to procure a first-class set of samples for the Bureau from all the discoveries, and am waiting with some degree of anxiety your report on the western deposit, namely, the one at Loon Lake."

On November 16th, 1903, the Toronto "Globe" had a half-column article, based on letters of W. G. Miller to the Bureau of Mines. The following sentences indicate the tenor of the article: "Rich discoveries along government railway. . . . Exceeding rich in nickel. . . . Silver, cobalt and arsenic also found. . . . One specimen of silver obtained by Mr. Miller was about the size of his hand, and half an inch thick.

On November 20th, another half-column article, an interview with W. G. Miller, appeared, in which are these sentences. "Temiskaming minerals. . . . Prof. Miller returned with samples. Says there is no doubt as to the importance of the find. . . . One large piece of silver weighs about ten pounds."

Interviews of this date also appeared in several other Toronto newspapers.

5 Geol. Sur. Can. Part H, Vol. XIV, 1901. Ont. Bur. Mines, Part III, Vol. XIV, 1905. A report on Sudbury, by Dr. Coleman is to be published by the Mines Branch, Ottawa, in 1913.



CARTE DES LACS DU CANADA

Dressée sur les Manuscrits du Depost des Cartes, Plans et Journaux de la Marine et sur le Journal du Rf de Charlevoix

Par N BELLIN Ingenieur et Hydrographe de la Marine 1744

ECHELLES

Lieues communes de France de 2282 Toises

Grandes Lieues de France de 2853 Toises

Fig. 6. Map published in 1744 showing that the argentiferous galena deposit on the east side of Lake Temiskaming (Ance à la Mine) was known at that date.

Character and Origin of Cobalt Veins

The deposits at Cobalt, on the other hand, occupy narrow, practically vertical fissures and joint-like cracks that cut through a series of slightly inclined metamorphosed fragmental rocks of pre-Cambrian age, known as the Cobalt series (Fig. 1). A few productive veins of similar form have been found in the adjacent intrusive diabase, known as the Nipissing diabase, and in the Keewatin, the oldest or basement series of the district, consisting typically of basic volcanic rocks. The two most productive veins in the Keewatin have been vein 26 on the Nipissing and that of the Temiskaming. The former vein lies near the edge of Peterson lake and close to the western edge of the diabase sill. Before erosion of the sill took place vein 26 lay beneath the sill or in its foot-wall. The Temiskaming vein, on the other hand, lies in the upper or hanging wall of the sill. There are examples of veins which run from the conglomerate and other fragmental rocks of the Cobalt series into the underlying Keewatin, and there are veins, *e.g.*, Nova Scotia and Temiskaming veins, which run

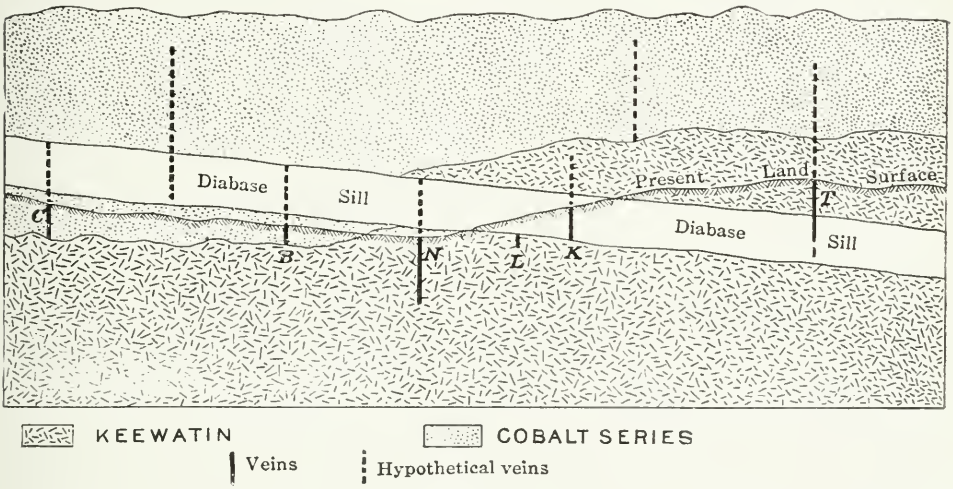


Fig. 7.

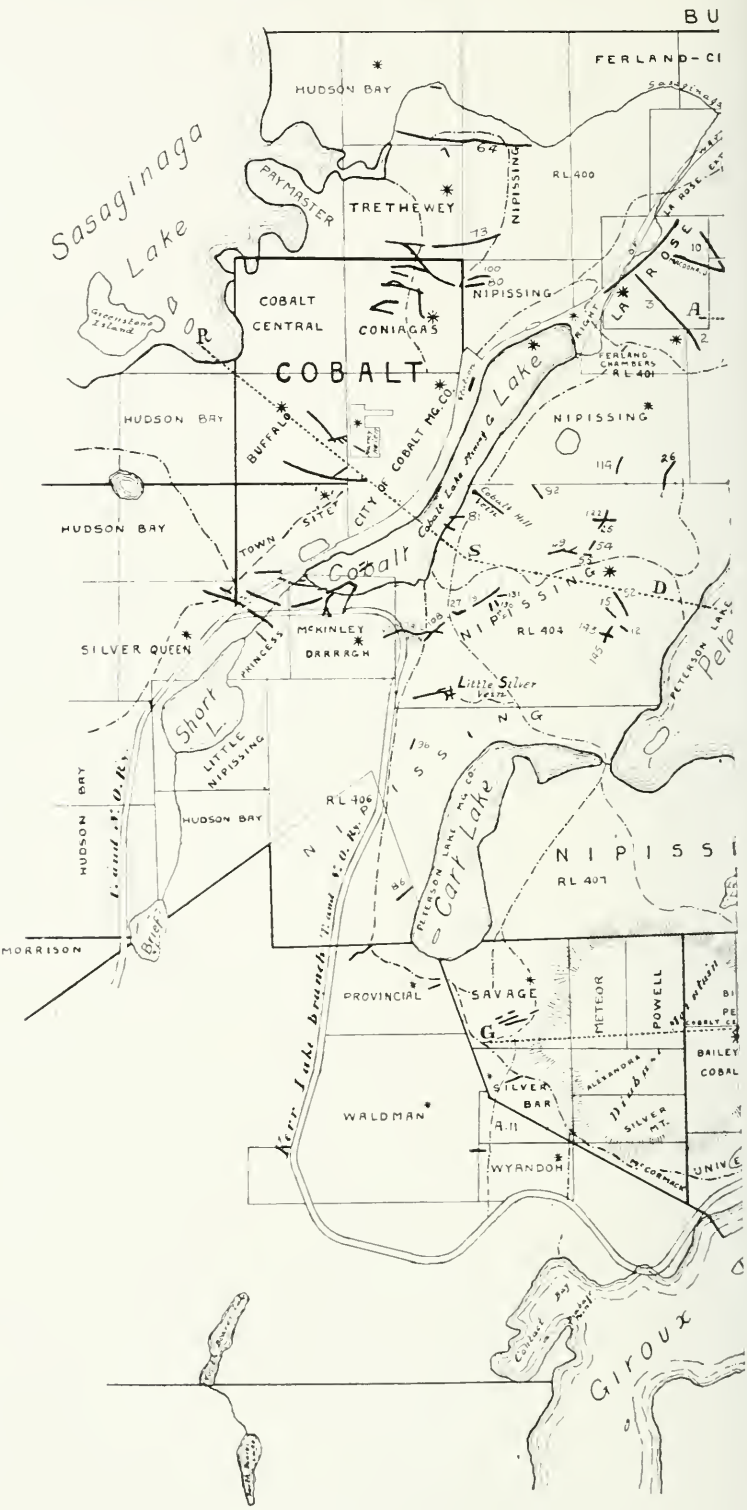
GENERALIZED VERTICAL SECTION THROUGH THE PRODUCTIVE PART OF THE COBALT AREA.

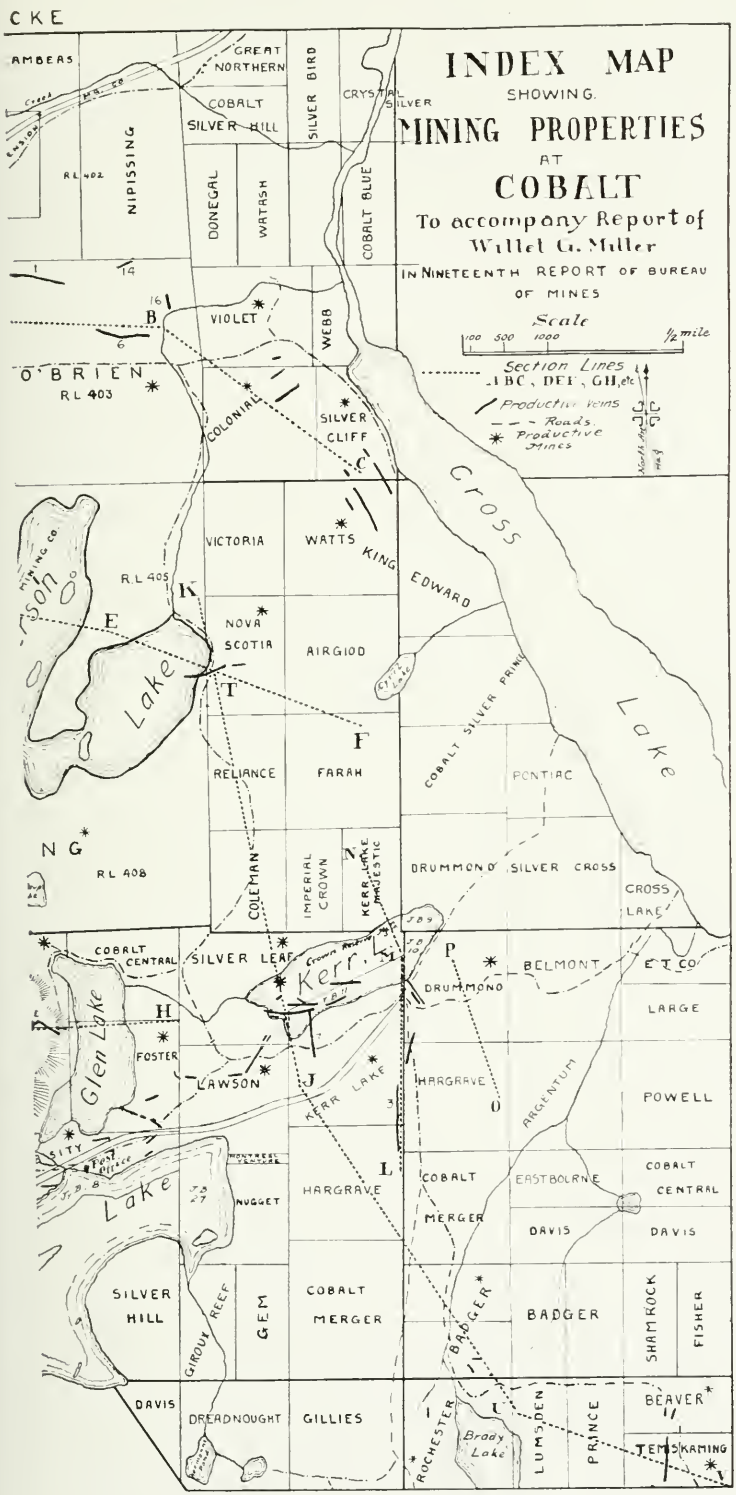
The section shows the relations of the Nipissing diabase sill to the Keewatin and the Cobalt series, and to the veins. The eroded surface is restored in the section. The sill is less regular than the illustration shows it to be.

B and C represent a large number of veins that are in the fragmental rocks, Cobalt series, in the lower or foot-wall of the eroded sill. N represents a type of vein, such as No. 26 on the Nipissing, in the Keewatin below the eroded sill, and L a type such as one under Peterson lake, in the Keewatin foot-wall, but not extending upward into the sill; K, a vein in the sill itself, such as No. 3 on the Kerr Lake property; T, a vein, such as that on the Temiskaming or Beaver properties, in the Keewatin hanging wall and extending downward into the sill.

downward from the Keewatin into the underlying, intrusive Nipissing diabase. The vein on the property, shown on accompanying maps under the name Cobalt Central, passes from the surface downward through the Nipissing diabase into the Cobalt series, which here forms the foot-wall of the diabase sill. Moreover, "blind" veins, or veins that do not outcrop at the surface, have been worked on several properties. One of the most interesting of these occurs beneath Peterson lake. This vein is in the Keewatin, which is here overlain by the Nipissing diabase sill. The vein runs up to the bottom of the sill, but not into it. Fig. 7 and the colored general cross-section, R. S. D. E. T. J. U. V., bring out the relationship of the rocks and the type veins described.

The colored cross-section mentioned shows the relationship of the rocks and veins for a distance of over four miles. It brings out the fact that the relation of the


HUDSON BAY
FERLAND-CH
Sasaginaga Lake
PAYMASTER
TRETHEWEY
RL 400
NIPISSING
LA ROSE
COBALT CENTRAL
CONIAGAS
COBALT
NIPISSING
FERLAND CHAMBERS RL 401
HUDSON BAY
BUFFALO
CITY OF COBALT MG. CO.
Cobalt Lake
NIPISSING
HUDSON BAY
TOWN SITE
Cobalt
NIPISSING
SILVER QUEEN
PRINCESS
McKINLEY DARRAGH
RL 404
Little Silver
Short L.
LITTLE NIPISSING
HUDSON BAY
HUDSON BAY
RL 406
Cart Lake
NIPISSI
RL 407
MORRISON
PROVINCIAL
SAVAGE
METEOR
POWELL
BAILEY
COBAL
SILVER BAR
WALDMAN
A.11
WYANDOH
Kerr Lake branch
Giroux


CKE
AMBEAS
GREAT NORTHERN
COBALT
SILVER HILL
SILVER BIRD
CRYSTAL SILVER
COBALT BLUE
NIPISSING
DONEGAL
WATASH
INDEX MAP
SHOWING
MINING PROPERTIES
AT
COBALT
To accompany Report of
Willet G. Miller
IN NINETEENTH REPORT OF BUREAU
OF MINES
Scale
100 500 1000
½ mile
Section Lines
Productive Veins
Roads
Productive Mines
O'BRIEN
R.L. 403
VIOLET
WEBB
COLONIAL
SILVER CLIFF
Cross
Lake
VICTORIA
WATTS
KING EDWARD
R.L. 405
NOVA SCOTIA
AIRGIOD
RELIANCE
FARAH
COBALT SILVER PRINCE
PONTIAC
R.L. 408
COLEMAN
IMPERIAL CROWN
KERR LAKE MAJESTIC
DRUMMOND
SILVER CROSS
CROSS LAKE
COBALT CENTRAL
SILVER LEAF
Kerr Lake
BELMONT
E.T. CO
LARGE
Glen Lake
FOSTER
LAWSON
HARGRAVE
ARGENTUM
POWELL
KERR LAKE
NUGGET
COBALT MERGER
EASTBOURNE
COBALT CENTRAL
DAVIS
SILVER HILL
GIROUX REEF
GEM
BADGER
SHAMROCK
FISHER
DAVIS
DREADNOUGHT
GILLIES
ROCHESTER
Brady Lake
LUMSDEN
PRINCE
BEAVER
TEMISKAMING

veins to the intrusive, flat-lying sill of Nipissing diabase is unique. The veins have not been filled by waters ascending vertically upward, as some writers on the Cobalt area have assumed; neither are the veins that are being worked the narrow parts of wide veins that penetrated the now eroded overlying rocks. It cannot be proved that any of the veins in the Cobalt area reached the surface as it existed at the time of the intrusion of the Nipissing diabase. The occurrence of "blind" veins makes it doubtful whether or not all the veins associated with the sill did not have a comparatively short vertical extension.

The deepest mines at Cobalt are the Temiskaming and Beaver. The shafts of both were started in the Keewatin, which here forms the upper or hanging wall of the sill. They have gone through the hanging wall and into the diabase.

Most of the ore in the Cobalt area has come from veins, or parts of veins, that originally lay beneath the sill, or in the foot-wall. Merchantable ore has not been found at so great a distance beneath the sill as above it. Unfortunately, however, little of the hanging wall remains, erosive agencies having removed it, together with much of the sill and the foot-wall.

The veins are described more systematically on following pages, but it was thought that an outline description in the introductory pages would be useful.

The material in these veins has, in all likelihood, been deposited from highly heated and impure waters which circulated through the cracks and fissures of the crust and were probably associated with—followed—the Nipissing diabase eruption.[6] It is rather difficult to predicate the original source of the metals—silver, cobalt, nickel, arsenic and others—now found in these veins. They may have come up from a considerable depth with the waters or they may have been leached out of what are now the folded and disturbed greenstones and other rocks of the Keewatin. Analyses of various rocks of the area have not given a clue as to the origin of the ores. However, the widespread occurrence of cobalt veins in the diabase, or in close association with it, shown by discoveries during the last seven or eight years, throughout a region three thousand square miles or more in extent, appears to be pretty conclusive proof that the diabase and the ores came from one and the same magma.

As these ore bodies in the vicinity of Cobalt station, and others in Ontario, may be said to be unique among those known in North America, we have no chance of instituting comparisons on this continent. Some European veins, however, such as those of Annaberg, Joachimsthal and other localities which will be again referred to, show a similar association of minerals.

These European ores are considered by most authors to be genetically connected with intrusions of granite. At Joachimsthal the veins are said to be cut across by basic dikes, and there is evidence to the effect that at the time of the eruption of the dikes the vein formation had not yet been completed. Since, especially nickel and cobalt minerals are characteristically genetically connected with basic rocks, the question arises as to whether the European ores mentioned may not be more closely connected in origin with basic rocks than they are considered to be. There may be deeper seated intrusions of these rocks slightly older than the dikes.

6 The waters are said to be associated or connected with the diabase eruption in the sense that they probably represented the end product of the eruption. In many volcanic regions hot springs are present long after the rocks have been solidified. In the Cobalt area the fissures and joints now occupied by the ores were probably produced by the gradual shrinkage in cooling of the diabase, the ores being deposited by the waters which represented the last stage of vulcanicity.

ORES AND MINERALS

The more important ores in the veins under consideration are native silver—associated with which is usually some dyscrasite, argentite, pyrargyrite and other compounds of the metal—smaltite, niccolite and related minerals. Many of the minerals occur mixed in the ores, and for this reason some of them have not been clearly identified. Another character of the minerals, which renders their identification difficult, is the fact that most of them occur in the massive form. Crystals when present are small, being frequently almost microscopic in size. The following minerals have been identified and can be conveniently classed under the headings:

I.—Native Elements:

Native silver, native bismuth, graphite.

II.—Arsenides:

Niccolite, or arsenide of nickel, NiAs; chloanthite, or diarsenide of nickel, $NiAs_2$; smaltite, or diarsenide of cobalt, $CoAs_2$.

III.—Arsenates:

Erythrite, or cobalt bloom, $Co_3As_2O_8+8H_2O$; and annabergite, or nickel bloom, $Ni_3As_2O_8+8H_2O$; scorodite, $FeAsO_4+2H_2O$.

IV.—Sulphides:

Argentite, or silver sulphide, Ag_2S; millerite, or nickel sulphide, NiS; argyropyrite?; stromeyerite? $(Ag,Cu)_2S$; bornite, Cu_3FeS_4; chalcopyrite, $CuFeS_2$; sphalerite, ZnS; galena, PbS; pyrite, FeS_2.

V.—Sulpharsenides:

Mispickel, or sulph-arsenide of iron, FeAsS; cobaltite, or sulph-arsenide of cobalt, CoAsS.

VI.—Sulpharsenites:

Proustite, or light red silver ore, Ag_3AsS_3; xanthoconite? Ag_3AsS_4.

VII.—Antimonides:

Dyscrasite, or silver antimonide, Ag_6Sb; breithauptite, NiSb.

VIII.—Sulphantimonites:

Pyrargyrite, or dark red silver ore, Ag_3SbS_3; stephanite, Ag_5SbS_4; polybasite? $AgSbS_2$; tetrahedrite, or sulph-antimonite of copper, $Cu_3Sb_2S_7$; freibergite? (silver-bearing tetrahedrite).

IX.—Sulphobismuthites:

Matildite, $AgBiS_2$; emplectite, $CuBiS_2$.

X.—Mercury:

Amalgam?

XI.—Phosphate:

Apatite.

XII.—Oxides:

Asbolite; heubachite?; heterogenite?; arsenolite; roselite?

XIII.—Veinstones:

Calcite, dolomite, aragonite, quartz, barite, fluorite.[7]

7 Barite and fluorite have not been found in the veins at Cobalt proper, but they occur with silver-cobalt ores in one or two veins near Elk lake, and in Langmuir township in the southeast part of the Porcupine area. Small veins of barite have also been found in the quartz-diabase in Leonard and Lawson townships, in the Gowganda area.

The table contains a few minerals that have been found in only one or two veins and cannot be considered characteristic. Millerite, for instance, is of rare occurrence, and emplectite has been found only in the Floyd mine, near Sharp lake, in the western part of the Cobalt area. Bornite, chalcopyrite, zinc blende, galena and pyrite are not characteristic of most of the ore, these minerals occurring more frequently in the wall rock or in non-silver bearing ore of the Keewatin. As a note on a following page shows, apatite in recognizable crystals has been found in the ore of only one mine. Mercury appears to occur in the ore of all the mines that contain high values in silver, but whether it occurs only as amalgam or in other forms has not been determined. Among the veinstones aragonite is found but rarely, at least in easily recognizable form, while barite and fluorite have not been observed in the veins at Cobalt proper.

A question mark has been placed after the names of several minerals in the table which have been reported to occur in the veins but whose identification has not been made complete by chemical analyses or crystallographic measurements.

Gold in small quantity has been found in a number of veins, especially in those in which cobaltite or mispickel are characteristic minerals. Certain shipments from the Temiskaming mine contained copper in economic quantities.

A characteristic of the group is the subordinate part which sulphur plays in comparison with arsenic. Antimony, which is not abundant, is found in some compounds where we would expect to find arsenic, since the latter is so much more abundant. For instance, while we have both native silver and arsenides in abundance the compounds of arsenic and silver occur only in small quantity. Then one would also expect to find more compounds of bismuth since this metal occurs in the free state in considerable quantities in some parts of the deposits. It might also be expected that native arsenic would occur at times.

It will be seen from a following page that nearly all the chemical groups of minerals found in the celebrated Joachimsthal deposits of Bohemia are present in the Temiskaming ores. The most important exception is uraninite or pitchblende, which came into prominence a few years ago on account of its being the chief source of the element radium. The Austrian Government, finding they had a practical monopoly of pitchblende, are reported to have prohibited its export.[8]

The Bohemian deposits appear never to have been so rich in silver, cobalt, nickel or arsenic as are those of Ontario.

Order of Deposition of Minerals

The following table shows, in descending order from the youngest to the oldest, the general succession in the order of deposition of the principal minerals of the Cobalt area proper. There appear to be, however, minor exceptions to this order.

III. Decomposition products, *e.g.*, erythrite or cobalt bloom, annabergite and asbolite.
II. Rich silver ores and calcite.
I. Smaltite, niccolite and dolomite or pink spar.

After the minerals of group I. were deposited the veins were subjected to a slight movement. In the cracks thus formed the minerals of group II. were deposited. A few veins that escaped the disturbance do not contain silver in economic quantity.

This order of deposition appears to be the same as that of the minerals in the Annaberg deposits of Germany and those of Joachimsthal, Austria.[9] At Annaberg the

8 The reserves of pitchblende in the Joachimsthal ore deposits, scientifically defined, are very small. Only a few tons are produced per annum, and these yield 2 or 3 grammes of salts of radium. Earlier less was produced, for the process of production was confined simply to obtaining radium without special attention to other radio-active elements. But, beginning with the year 1910, a more active and scientifically-organized production of radio-active substances was begun. Of all the pitchblende exploited up-to-date, the Joachimsthal ore is relatively the richest in radium. But the quantity of radium contained in it is exceedingly small. Two tons of ore yield only a few hundredths of a gramme of chloride of radium. Therefore, the labour of obtaining combinations of radium is confined almost to the capture of its atoms. The labour is very great, and its cost is colossal. The world's annual production of the salts of radium is 3 to 5 grammes, and £20,000 is the price per gramme.—The "Mining Journal," London, Feby. 8th, 1913, p. 134.

9 Beck, The Nature of Ore Deposits, Weed's translation, pages 285, 289.

uranium ore or pitchblende is said to have been deposited earlier than the rich silver ores and later than the cobalt-nickel minerals, while barite, fluorite and quartz were deposited prior to the latter. At Annaberg there are thus considered to have been broadly five periods of deposition, while at Cobalt there have been but three, minerals representing the first and third periods being absent.

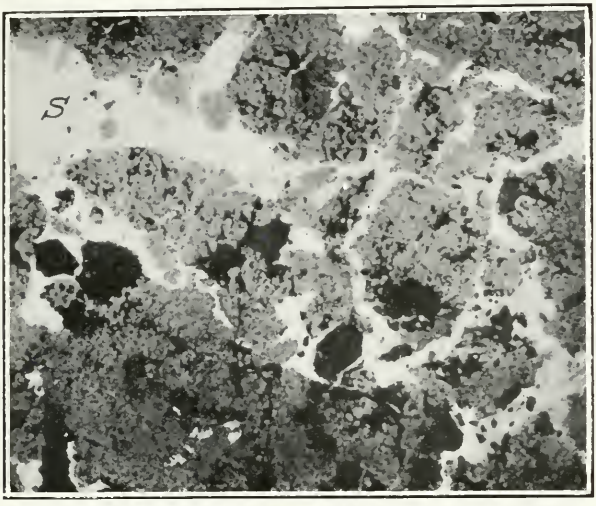


Fig. 8.

Polished surface of ore from La Rose Mine, Cobalt. The native silver, S, is the white material in the illustration. The large black spots are calcite, the small black ones niccolite, and the grey is smaltite.

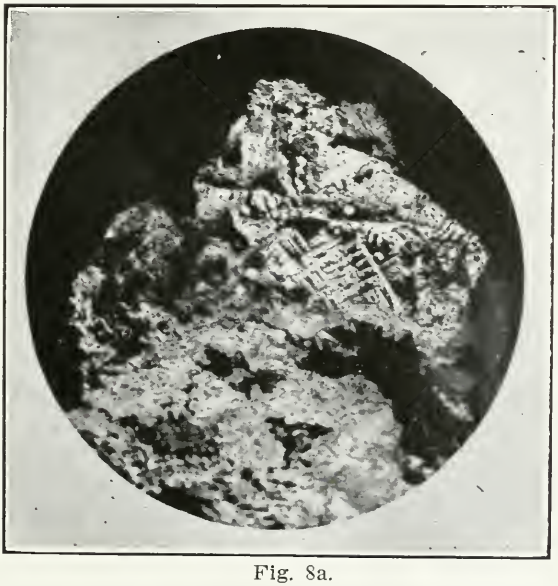


Fig. 8a.
Native silver.

Messrs. W. Campbell and C. W. Knight subjected specimens of the cobalt-silver ores to examination, using methods employed in metallography.[10] While their results confirm, in a general way, the author's observations on hand specimens and on blocks of ore, they have worked out the order of deposition of the minerals in greater detail. They say: "Although all of the structures met with in this examination cannot be satisfactorily explained, they point to the following order of origin for the principal constituents: First came the smaltite, closely followed by the niccolite; other minerals in small amount came down at this time. Then, after a period of slight movement in which the first minerals were more or less fractured, calcite was deposited as a groundmass. Later came argentite, which was followed by native silver and native bismuth. Lastly came the surface decomposition products, erythrite and annabergite.

"Arranged in tabular order, the succession is then as follows:

"Smaltite.
"Niccolite.
"*Period of movement and fracturing.*
"Calcite.
"Argentite.
"Native silver.
"Native bismuth.
"*Period of decomposition.*
"Erythrite and Annabergite."

At Annaberg bismuth ore is thought to have been deposited with the cobalt-nickel minerals and not with the rich silver ore. Moreover, at the time Messrs. Campbell and Knight made their examination of the ores from Cobalt it was not known that two carbonates occur as veinstones, viz., calcite and dolomite or pink spar. The latter has been found to belong to an older generation than the former. It may be added that, while much of the niccolite is later in order of deposition than the smaltite some of the former mineral appears to have been deposited earlier than some of the latter.

Any statement as to the form in which the native silver came in solution into the veins must be merely hypothetical. The author is inclined, however, to the view that much of this silver, at least, should be considered as a primary deposit from solutions that worked through the veins after they had been fractured and disturbed. It does not seem necessary to conclude that most of the native silver has been derived from the decomposition of compounds of the metal in the veins. Since it is associated with calcium carbonate it does not seem impossible that the silver circulated through the fissures as a double carbonate, being precipitated in the metallic form when conditions of pressure and temperature were favorable, and suitable precipitants were encountered. J. H. L. Vogt, for instance, regards a solution of silver carbonate, or bicarbonate, as the source of the metal in the Kongsberg veins, probably because of its association with calcite, and thinks that ferrous compounds or carbonaceous substances are the precipitants.[11]

Silver carbonate, Ag_2CO_3, like calcium carbonate, $CaCO_3$, is soluble in excess of carbon dioxide, CO_2. Hence when the calcite, $CaCO_3$ of the cobalt-silver veins was being carried in solution, it does not seem improbable that silver carbonate may have been in solution at or about the same time.

An interesting paper, recently written by Messrs. Chase Palmer and Edson S. Bastin, discusses "Metallic Minerals as Precipitants of Silver and Gold."[12] "The preliminary experiments here described show that certain sulphides and arsenides of copper and nickel precipitate metallic silver very efficiently from dilute aqueous solutions of silver sulphate. . . .

10 (1) Microscopic Examination of the Cobalt-Nickel Arsenides and Silver Deposits of Temiskaming. Ec. Geol., Sept.-Oct., 1906.
(2) The Paragenesis of the Cobalt-Nickel Arsenides and Silver Deposits of Temiskaming, Eng. and Min. Jr., June 9th, 1906.
11 The Data of Geochemistry, by F. W. Clarke, Bulletin 491, U.S.G.S. J.H.L. Vogt., Zeitschr. prakt. Geologie, 1899, pp. 113, 177.
12 Economic Geology, March 1913, p. 140.

"The more common sulphides, such as pyrite, galena, and sphalerite were relatively inactive as precipitants of silver from aqueous solutions of its sulphate."

Argentite, proustite and native silver, in hair-like crystals, appear at times, judging from their mode of occurrence, to be of secondary origin. These minerals are found in vugs or open spaces characteristically in the lower workings of the mines where the ore has become leaner or below the productive zone in the veins. Practically all the samples of native silver, excepting those that show a crystalline form, or occur in veinlets, contain mercury. It may be added that a minor quantity of native silver in veinlets is later in age than the more massive, less pure variety.

The silver-bearing solutions working downward beneath the sill, in the fractured veins, lost their silver content by precipitation on coming in contact with cobalt-nickel minerals before a great depth was reached. Hence, it is not surprising to find that rich silver ore does not extend to as great a depth beneath the sill as do the cobalt-nickel ores. Moreover, where a vein extends downward from the Cobalt series into the Keewatin, the part of it in the former series frequently appears to have been more fractured and disturbed, after the deposition of the cobalt-nickel minerals and before the deposition of native silver, than the part of it in the underlying tougher and more massive Keewatin. In such a case, silver-bearing or other solutions could not penetrate so readily the part of the vein in the Keewatin as the part of it in the Cobalt series.

Notes on Minerals

Native Elements

NATIVE SILVER

The greater part of the native silver of the Cobalt and surrounding areas is usually impure from the presence of antimony and other metals. It is closely associated with dyscrasite, and the mixture of the two minerals contains mercury, doubtless in the form of amalgam or other closely related compound.[12a] Much of the native silver occurs in cracks in the earlier deposited minerals—smaltite, niccolite and calcite or dolomite. It frequently forms veinlets in the wall rock of the veins, especially in the diabase. Boulders of granite, a foot or more in diameter, in the conglomerate through which the veins cut at the Coniagas, Trethewey and other mines have been found with delicate veinlets of silver running through them.

While the silver does not usually occur in crystal form, it has been found in two or three veins in fairly well developed octahedrons. It also occurs occasionally in coarse, intergrown, filiform crystals, and in mossy forms. Usually, however, the mineral is found in masses or slabs, flakes and films. Hair silver is found in vugs.

The percentage of silver in certain museum samples and in shipments of ore is given on following pages.

The silver appears to represent two, or more, periods of deposition. The purer, better crystallized, less common variety seems to have been deposited in some cases, at least, later than the more impure.

Figs. 8, 9, 10 are from photographs of native silver.

12a " . . . . the ordinary high-grade ore of the district usually carries from two to five pounds of mercury per ton of ore, depending upon the metallics contained. Tests were made on the metallics alone; 21 samples of metallics taken from various Nipissing veins and from three other mines showed mercury in every case, the result varied from 8 to 95 lb. mercury per ton of metallics, and averaged 35 pounds." Nipissing High Grade Mill, Cobalt, by R. B. Watson, Eng. and Min. Jr., Dec. 7th, 1912.

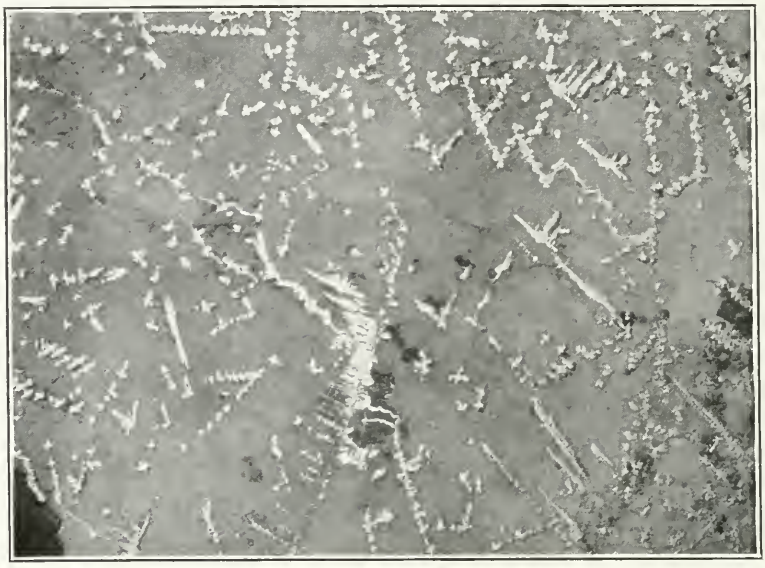


Fig. 9. Native silver in calcite, slightly reduced in size, Temiskaming mine, Cobalt.

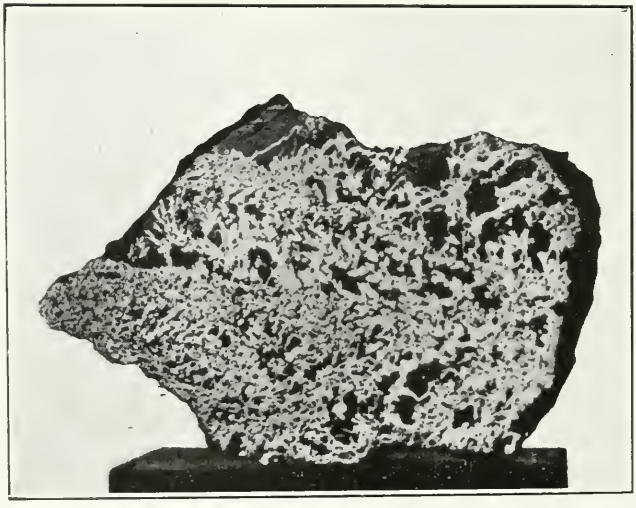


Fig. 10. Native silver.

NATIVE BISMUTH

Native bismuth has been found in practically all the veins which have been opened up. On freshly broken surfaces it has almost the color of native silver but is more readily cut. It soon tarnishes on exposure to the air and takes on a rather striking yellowish or reddish color, somewhat like that of pyrite or bornite.

	Per cent.
Bismuth	99.20
Cobalt	distinct trace
Nickel	trace
Iron	.40
Silver	trace
Arsenic	trace
Antimony	none
Total	99.60

This analysis represents a sample from the Cobalt Hill vein on the Nipissing property.

Fig 11.—Spheroidal intergrowth of smaltite and calcite, almost natural size. The smaltite is lighter in color than the calcite in the illustration.

GRAPHITE

This mineral was closely associated with the ores of the Cobalt Hill vein, on the Nipissing property. The main shaft of La Rose mine passed through a zone of rock highly impregnated with it at a depth of 200 feet or over. Certain schists, that have been classed as of Keewatin age but which may belong to the Grenville, are highly impregnated with graphite.

Arsenides

SMALTITE

Much of the massive smaltite of the veins when carefully examined, or when submitted to chemical analysis, proves to be impure from the admixture of niccolite and other minerals. Nickel also replaces cobalt and the mineral graduates towards chloanthite. Occasionally smaltite is found in small, well-formed crystals (Figs. 11, 13).

NICCOLITE

A sample from La Rose mine, consisting essentially of niccolite, was found to contain 5.02 oz. of silver to the ton, and nickel 26.64, cobalt 6.16, arsenic 45.64 per cent.

Niccolite, smaltite, and native silver are the most characteristic minerals of the veins.

BREITHAUPTITE

This mineral is found in La Rose, Hudson Bay and other veins. There is apparently a graduation from it to niccolite by the substitution of arsenic for antimony.

CHLOANTHITE

A sample of chloanthite, in nodular form, from La Rose mine, J S 14, was found to have the following composition:

	Per cent.
Nickel	23.24
Cobalt	4.11
Silver	2.78
Sulphur	2.18
Arsenic	67.17
Antimony	none
Total	99.48

The chloanthite occurs characteristically in small nodular or spheroidal masses in calcite.

Fig. 12. Cobalt Hill vein, northwest corner of location R L 404, Nipissing mines. The photograph shows the fractured character of the rock and a gentle anticline. The vein is seen to be in step-like forms as if it had been affected by horizontal faults, but the ore is not brecciated.

Additional Notes on Arsenides

In order to show the character of the more massive cobalt-nickel ore of the area, a description of the vein known as Cobalt Hill may be given. This vein was one of the first four found in the area. Unlike the other three, and most of the cobalt-nickel veins since discovered, it did not contain silver in economic quantity, owing apparently to its not having been subjected to secondary disturbance. The vein is near the shore of Cobalt lake, in the northwest corner of location R.L. 404, on the Nipissing property. Its strike is northwest-southeast.

The more or less well banded slate-like greywacké, through which the Cobalt Hill vein cuts perpendicularly, dips westward towards Cobalt lake at an angle of 20 or 30 degrees in the direction in which the vein strikes. The rock is slightly arched over the vein, thus producing a gentle anticline, which pitches towards the lake (Fig. 12). The vein is at a height of 100 feet above the lake.

At the points where it was originally exposed, the vein showed a width of 14 inches of massive ore, and vugs two feet or more in the wall rock from the edge of the vein contained cobalt bloom. It may be added that in certain of the other veins the wall rock is impregnated with native silver, which is found even in the centre of boulders of granite in the conglomerate.

Very little veinstone, such as calcite or quartz, is present. When examined carefully in hand specimens, this apparently massive, uniform, gray ore is found to contain essentially two constituents. Set through the gray ground mass are grains of the copper colored niccolite, the ground mass itself being smaltite. Occasionally the smaltite in tiny vugs shows crystals large enough to be recognized. Minute crystals of smaltite also occur in the wall rock. No crystals of the niccolite have been recognized. There are probably some other closely related arsenides of cobalt in addition to smaltite in this ore. The diarsenide of nickel, chloanthite, is also present. At times some massive tetrahedrite is seen, and it is usually associated with copper pyrites, which assists in its identification. It is, however, usually readily recognizable by its black color and bright appearance.

Much of the surface of this ore shows the decomposition product, cobalt bloom, the arsenide having been changed by atmospheric agencies to the arsenate, the oxidized form. There is at times some green decomposition material, which is the arsenate of nickel, known as annabergite. Occasionally the cobalt bloom shows a crystalline structure, being in the form of delicate rosettes. The bloom, which is of a delicate pink color, can be easily recognized, if one has any difficulty in distinguishing it from certain shades of red oxide of iron, by heating it gently, when it will take on a blue color. This is characteristic of all hydrated salts of cobalt. They are pink or, if in dilute solutions, almost colorless. Sympathetic ink, for instance, is a dilute solution of cobalt salt. If a pen be dipped into it and used for writing on paper, the writing is invisible until the paper is heated, driving off the water and dehydrating the salt, which then takes on a distinct blue color.

In most of the veins where silver is found in important quantities, a uniform massive structure like that of the vein just referred to is not exhibited. There is more or less calcite present, and at times a little quartz. The veins sometimes show a crudely banded structure.

Smaltite, and the corresponding arsenide of nickel, chloanthite, are said by most authors to pass into each other by the substitution of cobalt for nickel and *vice versa*. Niccolite, in the analyses quoted by Dana and others, carries only a small percentage of cobalt and iron, while smaltite frequently contains a considerable percentage of nickel and iron. In the ore under consideration the cobalt and nickel appear to be, for the most part, in distinct compounds. In the analysis (No. 1), if we consider the 7 per cent. of nickel to exist as niccolite, and the percentages of iron and cobalt, 6.3 and 16.8 respectively, to represent smaltite, the theoretical percentage of arsenic in the ore should be 68.47 instead of 69, as found by analysis. The percentage of niccolite

Analyses of Cobalt Hill Ore

Constituent	1	2	3	4	5
Cobalt	16.8	16.7	16.76	19.80	21.70
Nickel	7.0	6.8	6.24	4.56	
Iron	6.3	7.5	.....	6.20	8.89
Arsenic	69.0	62.0	66.60	60.30	63.55
Sulphur		7.0	3.37	4.09	5.38
Insol. silica, etc	0.9	.....	.....	2.40	0.60
Water	.....	.....	.....	2.00	.....
Totals	100.0	100.0	.....	99.35	100.12

by weight would be 15.94, or about one-seventh part of the whole by volume, since niccolite has a somewhat higher specific gravity than smaltite.[13] Specimens of this ore when examined with the magnifying glass, appear to agree with this.

Of the above analyses, Nos. 1 and 2 were made by Mr. O. S. James. The former represents a hand specimen from near the surface, and the latter a specimen from a depth of about 20 feet; 3 and 4 are of average samples collected by the writer, the former from the uppermost opening on the hill, and the latter from the middle or main opening, the analyst being Mr. A. G. Burrows. Sample 3 contained considerable cobalt bloom. Analysis 5 is by Dr. J. Waddell. It represents a specimen collected by Prof. Nicol. This specimen was not taken, like 3 and 4, with the object of determining the average composition of the vein. Prof. Nicol states that a qualitative analysis showed the presence of small amounts of copper and lead, and the absence of antimony, bismuth and zinc.

Minute, brilliant, silver-white, or tin-white, crystals, occur sparingly, imbedded in the wall-rock and in the ore. The crystals are cubes and combinations of this form,

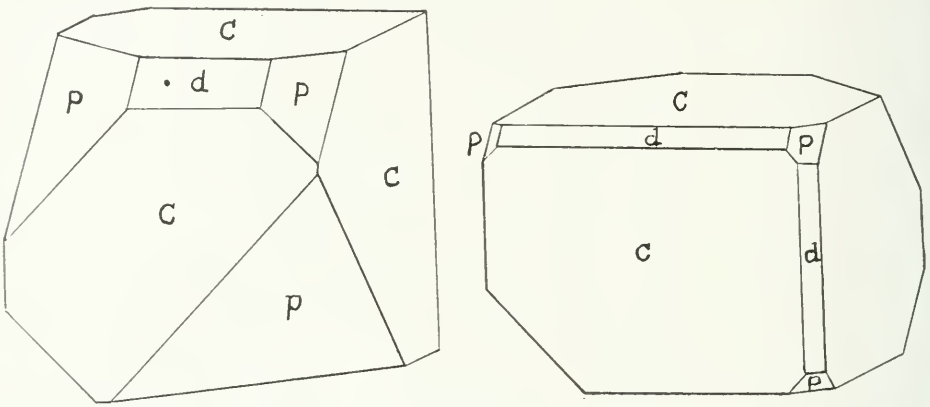


Fig. 13. Smaltite crystals from the Cobalt Hill vein, Nipissing mines, measured and drawn by Prof. William Nicol of the Kingston School of Mining. C = cube, P = octahedron, d = rhombic dodecahedron.

with the rhombic dodecahedron, and octahedron. Prof. Nicol, who has measured some of them on the goniometer, has found them to be smaltite (Fig. 13). The white or gray colored arsenides show a tendency to form globular or spheroidal masses, with a radiated structure. Some of these masses in calcite have a diameter of over half an inch.

The ore is at times somewhat porous, spaces being left between the globules, which are tarnished almost black on their surfaces. Where the surface of the ore has been exposed to the action of water or ice, it has a dark color not unlike that of the wall rock, bloom, the product of decomposition, having been carried away. The ore is coated with a fraction of an inch of the dark decomposed material.

Small grains of quartz are found sparingly in the ore.

Copper pyrites, with which is usually associated gray copper ore, tetrahedrite, is found in the deposit. Native bismuth is also of frequent occurrence.

Veinlets at Lake Shore

Two veinlets, at the time the camp was discovered, were to be seen near the water level on the east side of Cobalt lake, not far from the point where the north boundary of location R L 404 meets the shore. A sample was taken from these veinlets and was found to have the following composition, showing that it is much like the massive ore on the Cobalt Hill vein.

13 Specific gravities: niccolite 7.33-7.67, smaltite 6.4-6.6, native silver 10.1-11.1. It may be added that a determination of the specific gravity of a number of samples of ore from one of the cobalt-silver veins showed it to average 4.85.

	Per cent.
Cobalt	17.84
Nickel	4.16
Arsenic	56.10
Sulphur	5.98
Iron	9.22
Insoluble	4.32
Bismuth	No indications
Silver	No indications
Antimony	No indications
Water	Not determined

Sample shows cobalt bloom.

Arsenates

COBALT BLOOM OR ERYTHRITE

Mr. W. F. Green has made a detailed examination of some of the crystallized bloom and given a full description of the faces present.[14]

The bloom found generally in the veins is the earthy variety and seldom shows good crystallization. Mr. Green describes the material examined by him as follows:

"The crystals occur in the form of a druse, and are attached to the matrix by one end of the vertical axis. They are small, and where examined closely most of them are found to be a growth of thinner crystals in approximate parallel position."

ANNABERGITE

This secondary mineral, at times known as nickel bloom, occurs in most of the veins. When intermixed with cobalt bloom its color is masked.

WHITE BLOOM

Associated with the cobalt bloom in the weathered parts of La Rose and other veins there is a white, clay-like material, which resembles in form the moist cobalt bloom. The writer suspected that the white color of this material was due to the intermixture of the green nickel arsenate, annabergite, with the pink cobalt bloom. An analysis by Mr. Burrows confirmed this opinion. It is a rather interesting occurrence. In pottery the blue cobalt compounds are used in small quantities to destroy the delicate reddish tonge due to iron in the ware. In this white bloom one color is destroyed by another in nature.

	Per cent.
Nickel oxide	29.30
Cobalt oxide	6.43
Arsenic pentoxide	38.31
Lime	.84
Magnesia	1.12
Iron	.30
Water	24.04
Total	100.34

Mr. Burrows says: "In evaporating the solution of the metals I had a very interesting result. The solution was quite concentrated, and on cooling, green acicular crystals of the nickel compound separated out, while the solution above and around them was quite pink. The original solution before the crystallizing out of the nickel compound was quite blue."

14 Trans. Can. Inst., Toronto, Vol. VIII, part 3, April, 1909, pages 443-450.

Sulphides

ARGENTITE

This mineral occurs in most of the veins but is not so common, nor does it occur in such quantity, as native silver. While usually without crystal form, at times it occurs in well developed crystals, of larger size than those of any other metallic minerals in the veins.

MILLERITE

This mineral is very rare in hair-like crystals and has not been observed in other forms.

Sulpharsenides

COBALTITE

Under some conditions, this mineral is difficult to distinguish from smaltite. Its presence in certain of the Cobalt veins, notably the Temiskaming Cobalt mine, afterwards known as the Agaunico, and in the Columbus has been definitely determined. No. 1 represents the result of an analysis, by Mr. J. S. DeLury, of crystals from the latter mine and No. 2 ore from the former. The latter sample carried $5.20 in gold to the ton. Good crystals were found at the Columbus.

	(1)	(2)
Iron	4.55	not det.
Arsenic	44.55	41.65
Sulphur	20.73	17.18
Cobalt	29.10	32.42
Nickel	.97	....

MISPICKEL

Mispickel is not so common in the deposits as one might expect it to be. In some of the veins first discovered on what is now known as the Buffalo mine, in the town plot of Cobalt, mispickel seems to be a characteristic mineral.

	(1)	(2)	(3)
Iron	34.4	26.76	28.83
Arsenic	46.	41.76	40.08
Sulphur	19.6	17.63	19.25
Cobalt	....	3.21	4.83
Nickel	....	.76	....
Silver	....	....	306.1 oz. per ton

No. 1 shows the theoretical composition of mispickel; Nos. 2 and 3 are analyses of mispickel from the south vein (of the two discovered in 1904) on the Buffalo mine. This ore occurs in the Cobalt series not far from the contact with the Keewatin.

In connection with these the following analyses, Nos. 1 and 2, of samples of mispickel from the Big Dan and Little Dan claims near Temagami will be of interest.

	(1)	(2)
Iron	29.68	29.84
Arsenic	36.24	36.81
Sulphur	18.99	18.77
Insoluble	13.52	13.02
Water	.72	.79
Cobalt	....	....
Nickel	....	....

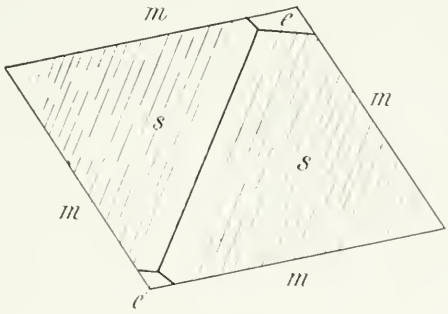


Fig 3a

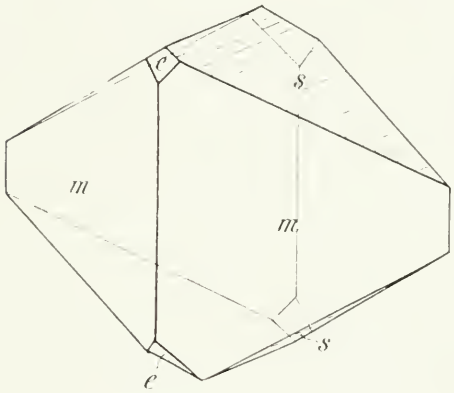


Fig 3b

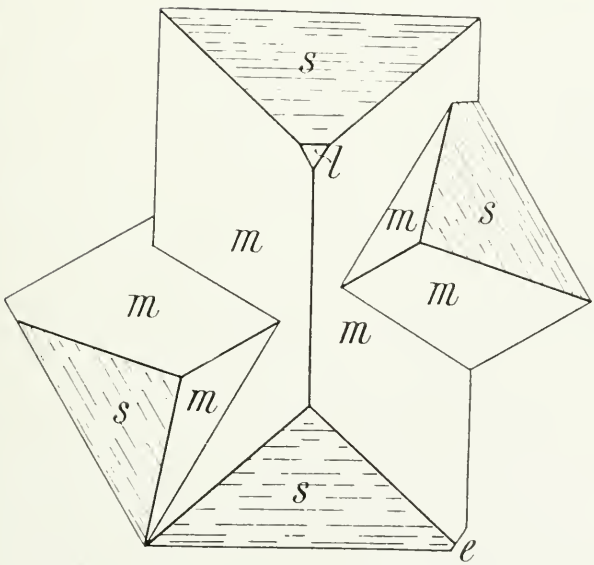


Fig 4

Fig 14 (3a, 3b, 4). Crystals of Mispickel.

No. 1 represents selected particles from a sample taken at the Little Dan claim. In addition to the components shown, the sample carried $4.00 worth of gold and 59 cents worth of silver per ton. No. 2 represents selected particles from the Big Dan claim. This ore showed values per ton of $3.20 in gold and 54 cents in silver. The deposits are in the Keewatin.

Crystals of Mispickel

The following notes on crystals of mispickel or arsenopyrite have been kindly supplied by Prof. Nicol.

"From the Cobalt district, which has produced so many interesting minerals, the mineral glaucodot, on the authority of chemical analysis, has been reported. It seemed desirable to confirm this report by a crystallographic examination of some crystals admittedly orthorhombic. During a visit to Cobalt in the spring of 1910, the writer obtained from Mr. Arthur A. Cole a number of well-formed crystals which it was supposed might prove to be glaucodot.

"A chemical examination, however, showed that the little crystals contained only iron, sulphur and arsenic, and no cobalt, and were therefore to be regarded as arsenopyrite or mispickel. This is somewhat surprising, owing to the occurrence of this mineral in a cobaltiferous vein.

"The arsenopyrite crystals are perfectly formed individuals and occur imbedded in a clayey mass in a cobaltiferous vein at the Keeley mine, in South Lorrain. They occur as simple crystals, twins, trillings, and also irregular groups. Several were measured in order to determine the forms present, the twinning law and the crystallographic elements. In Figs. 14 and 15 (3, 4 and 5) are pictured a simple crystal, a twin and a trilling, as nearly as possible true to nature.

"The forms S=0½(012) and M=∞(110) in all cases determine the habit. In some cases the prism M is larger, in other cases smaller, than the dome S, thus causing variation in habit. The forms e=10(101) and l=01(011) occur with very small, unimportant faces.

Crystal I:

A simple crystal; dimensions 1×1.5×2 mm.

Fig. 3a shows the crystal as top view. Fig. 3b in perspective.

Combination:

m, s equally developed.

e small.

Crystal II:

Penetration twin.

Dimensions of the group 2×2×1 mm.

Twinning plane e=10(101).

Fig. 4 shows this crystal as top view, projected on the face a=0∞(010) common to the two individuals.

Combination:

m, s, predominating.

l, e, small.

Crystal III:

Penetration trilling.

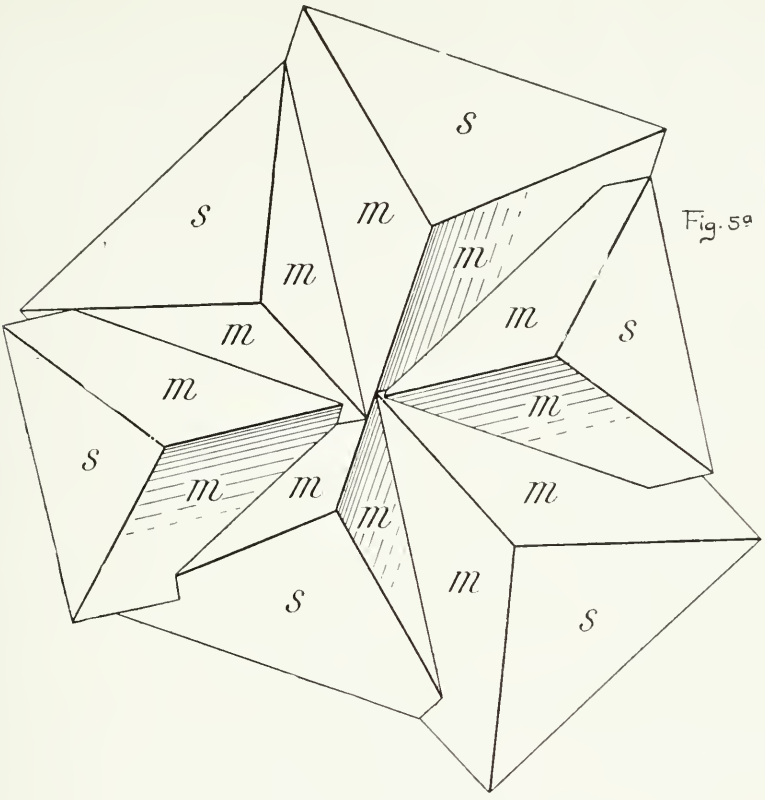
Dimensions of the group 1.5×1×1 mm.

Twinning plane here also e=10(101).

It has only the forms m=∞ (brilliant).

s=0½ (striated), about equally developed. The three individuals of the group are of about the same size.

Fig. 5a shows the trilling as top view, projected on the face a=0∞(010) common to the three individuals.



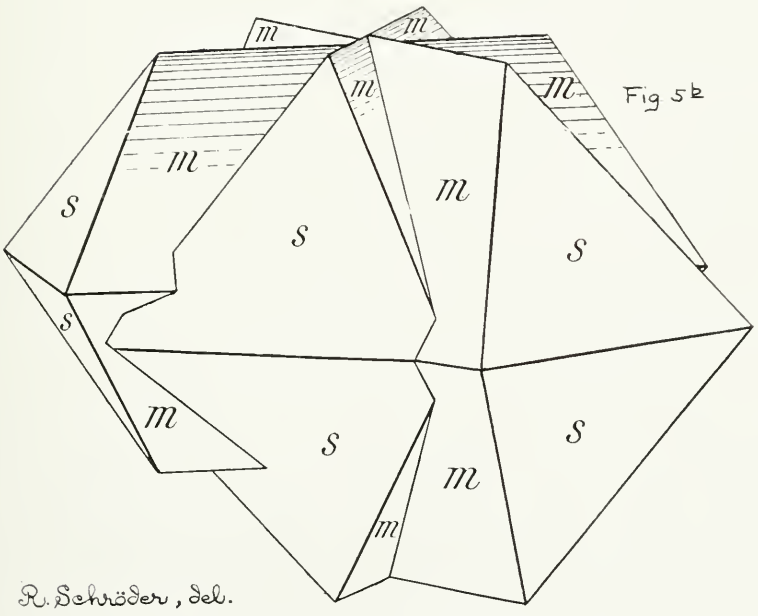


Fig. 15 (5a, 5b). Crystals of Mispickel.

Fig. 5b shows the trilling in perspective.

"The drawings were made with great care, as nearly as possible true to nature, by R. Schroeder, of Heidelberg.

Elements:

"As shown by the investigations of Arzruni and Baerwold, the elements of arsenopyrite vary much, especially the prismatic angle m m.* According to these authors this depends upon the varying proportion of FeS_2: $FeAs_2$ of the arsenopyrite of the various localities.

"Our arsenopyrite from Cobalt gives as an average:
m m=67° 36′
s s=61° 36′
From these angles the elements:
p_0=1.7809
q_0=1.1922
a:b:c=0.6694:1:1.1922 are obtained.

"Therefore it is placed at the end of the row which according to Arzruni has the highest percentage of $FeAs_2$.

"It is desirable to have from the crystals of the presently described locality a definite quantitative analysis, in order to decide whether Arzruni's statement regarding the connection between composition and crystalline form holds in this case. To accomplish this, however, would require the collection of much more material than is available."

Sulpharsenites

PROUSTITE

This mineral appears to be more characteristic of veins in the diabase than of those in the other rocks at Cobalt. It occurs in small quantity.

XANTHOCONITE

This sulph-arsenite of silver is believed by Prof. Nicol to be present in certain of the Cobalt ores in the form of minute crystals, which have not, however, been measured or analyzed.

Antimonides

DYSCRASITE

A sample of dyscrasite from La Rose mine was found by Mr. Burrows to have on analysis the formula Ag_6Sb. The more common variety of this material in other districts has the formula Ag_3Sb.

Another sample was analyzed by Mr. N. L. Turner, with the following result, showing it to be Ag_8Sb.

Silver	83.90
Antimony	15.60
Arsenic	very small amount
Cobalt	trace
Total	99.50

The most striking samples of dyscrasite probably came from a vein on the Kerr lake property, near the shore of the lake and at the surface of the vein. The vein also contained very beautiful samples of native silver, associated with argentite. Dyscrasite is of fairly common occurrence in the veins in association with native silver. Much of the latter contains antimony. Amalgam is apparently associated with much of the dyscrasite of the Cobalt veins.

*Zeitschr. Krist. 1878, 2.430; 1883, 7.337.

BREITHAUPTITE

This antimonide of nickel is present in some of the veins and passes into niccolite by the substitution of arsenic for antimony.

Sulphantimonites

PYRARGYRITE

This mineral is of rare occurrence in the veins at Cobalt.

The following note on the pyrargyrite crystals from La Rose mine is by Prof. Nicol:

"The crystals occur as an incrustation on the surfaces of chinks or cracks in the country rock intimately associated with argentite or silver glance.

"The crystals are more or less well developed hexagonal prisms, terminated in some cases by rhombohedrons and scalenhedrons. The crystal reproduced in the drawings shows a somewhat peculiar development—only five faces of the prism of the first order *a* are present; the sixth face *b* is a single representative of the prism of the second order."

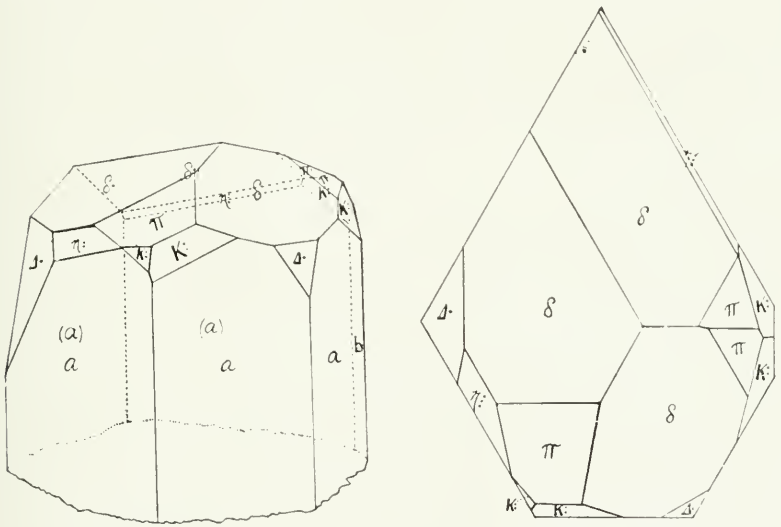


Fig. 16.

Pyrargyoite Crystal.

POLYBASITE

Prof. Nicol believes that the occurrence of this mineral in the Cobalt deposits is pretty well established, but sufficient material for analysis has not been obtained.

STEPHANITE

During a visit to Cobalt, Prof. Nicol, through the kindness of Capt. John Harris, of the Colonial mine, obtained a specimen carrying many small glistening stephanite crystals. These lie separately on crystallized calcite, which is the filling of a vein and encloses native silver. The following notes were given by Prof. Nicol:

"Stephanite has frequently been reported from the Cobalt district along with other silver ores, such as dyscrasite, pyrargyrite, proustite, argentite, matildite and polybasite. Several of these, however, have been determined simply by the use of the blowpipe. It therefore seemed worth while to subject such good material to a crystallographic examination. The measurements were made under Prof. Goldschmidt's direction on the two-circle goniometer and the drawings were made by Prof. Goldschmidt's assistant, R. Schroeder.

"One small but perfectly formed crystal, with forty-odd faces, was measured. This proved to be a trilling according to the known law for stephanite: twinning plane, a prism face o= ∞ ,(110). The crystal may be described as follows:

Dimensions: 1×1×1.5 mm. Fig. 17 (1a) shows a top view of the crystal; Fig. 17 (1b) is a perspective picture.

"Observed forms:

Letter:	c	b	o	π	t	k	d	e	ℓ	q·	m·	h·
Symbol:	0	0∞	∞	∞3	0$\infty\frac{3}{3}$	01	02	04	$\frac{1}{2}$0	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$
Miller:	001	010	110	130	023	011	021	041	102	114	113	112

Letter:	P·	r·	w·	?C	K·	f·	g:	v:	ϑ:	ω:	n:
Symbol:	1	2	13	16	$\frac{1}{3}$1	$\frac{1}{3}$1	24	$\frac{1}{2}\frac{3}{2}$	$\frac{1}{2}\frac{5}{2}$	$\frac{1}{1}\frac{3}{1}$	$\frac{1}{5}\frac{3}{5}$
Miller:	111	221	131	161	155	133	241	132	152	134	135

"All these forms were already known. All are certain with the exception of C.

Large: c b o P· d· r· ω·
Medium: π k m· h· m· v· ϑ:
Small: t e ℓ q· K· f· g: n:
Uncertain: C·

"Combinations.

Crystal I: c b o π t k d e ℓ q· m· h· P· r· w· C· K· f· v· ϑ: ω: n:
Crystal II: c b o . . . d . . . . h· P· r· . . . . g· ϑ:
Crystal III: b

MIXED DARK MINERAL

There is a mineral, or mixture of minerals, of fairly common occurrence in some of the narrow stringers which run off from the main La Rose vein and elsewhere. Some of this was sent to Mr. Burrows for analysis. He was, however, not able to get a sample which he considers represents a single mineral. From one specimen sent to him by the writer he obtained the following percentages:

	Per cent.
Silver	57.40
Sulphur	15.94
Antimony	7.92
Iron	3.88
Arsenic	.52

Mr. Burrows afterwards analyzed other samples but with unsatisfactory results. For instance, he found the following percentages of silver: 47.24, 47.38, 64.29, 62.56, 63. He also proved the presence of lead in samples examined later. In one case he got 9 per cent. of lead, and in another only about 1.8. He found these samples to show considerable free silver, which no doubt accounts for the varying percentages of this metal, and that the mineral did not look the same in all parts, some of it being of a dull lustre and other parts bright.

TETRAHEDRITE

Mr. Burrows found a specimen of the tetrahedrite, which occurs massive, to possess the following composition:

	Per cent.
Copper	36.04
Sulphur	22.86
Antimony	21.86
Zinc	8.14
Iron	9.84
Cobalt	none
Nickel	none
Lead	not det.
Total	98.74

Tetrahedrite has been found in most of the mines at Cobalt.

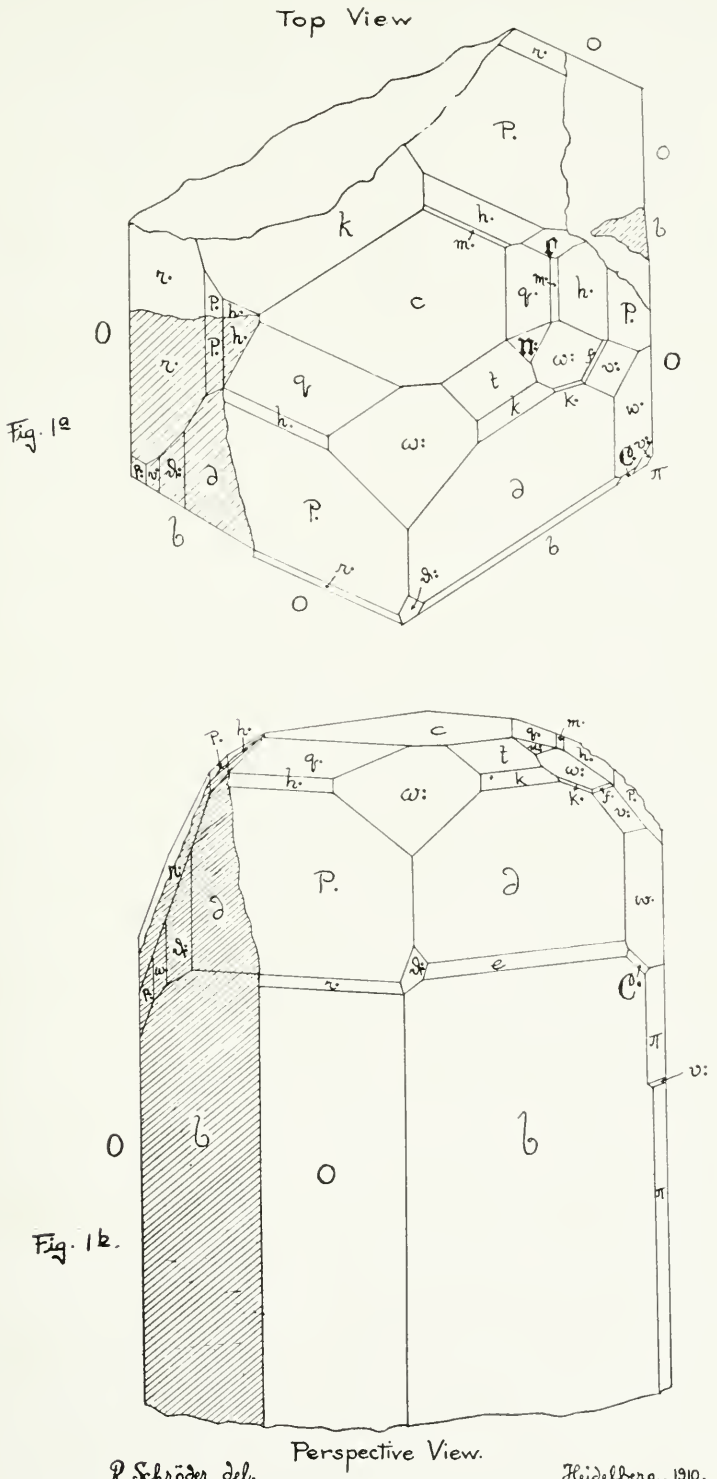


Fig. 17—Stephanite Crystal.

Sulphobismuthites

MATILDITE

A sample from the Nipissing mine, that appeared to be matildite, was submitted to Mr. N. L. Turner for analysis. In the following table, No. 1 gives the result of the analysis, and No. 2 is the theoretical composition of matildite.

	(1)	(2)
Silver	22.28	28.40
Sulphur	14.12	16.90
Bismuth	63.25	54.70
Total	99.65	100.00

Commenting upon the sample, Mr. Turner said: "Owing to the presence of native bismuth, it was impossible to prepare a pure sample. Consequently, the sample shows an excess of bismuth. A small quantity of arsenic was also present. The bismuth was completely surrounded with the other mineral."

Theoretically, in matildite the 22.28 parts of silver require 13.25 of sulphur. This shows that matildite is in all probability present in the sample analyzed.

EMPLECTITE

This mineral, to which reference is made on a preceding page, has been found only at the Floyd mine, to the west of Cobalt, near Sharp lake.

Phosphates

APATITE

Prof. Wm. Nicol found this mineral at the Columbus mine. He says it occurs in small, prismatic crystals, yellowish in color, without terminal planes. The crystals are about one-fourth to one-sixteenth of an inch in length. They were found in the decomposed matter in the druses in the rock associated with loose cobaltite crystals.

Veinstones

QUARTZ

This mineral is found rarely in the characteristic veins at Cobalt.

BARITE and FLUORITE

Barite and fluorite are characteristic veinstones in cobalt-silver deposits similar to those of Cobalt, *e.g.*, in the silver area near Port Arthur, Ont., and in well known veins of Germany and Austria. The former mineral has not been recognized by the writer in the veins at Cobalt proper, but occurs in the Cragg vein at Elk lake and in one or two other veins in the outlying areas. Both barite and fluorite are found with silver ore in veins in the township of Langmuir, southeast of Porcupine.

CALCITE and DOLOMITE

While the carbonate most characteristic of the veins is white in color, there is also a pink or reddish variety which may be said to occur more commonly in the deeper workings and to be associated with ore that carries little or no silver. In other words, the white variety, calcite, is associated with the richer ore, while the red variety, dolomite, is frequently met with when the values are disappearing. This relation does not always hold, and by solution and redeposition, no doubt carbonates of varying composition have been formed in the veins. The pink variety appears to be the older and the white the younger. The following are results of analyses of samples of the white or grey veinstones:

	1	2	3
Calcium carbonate	99.46	88.82	81.31
Magnesium carbonate	....	9.09	12.42
Iron and alumina	.12	1.70	5.73
Insoluble residue	....	0.45	0.52
Total	99.58	100.06	99.98

The sample represented by No. 1 came from the vein at the Violet mine in the diabase. It was taken by the writer and analyzed by Mr. Burrows. The absence of magnesium is noteworthy. Sample No. 2 came from vein 64 of the Nipissing, and No. 3 from the Crown Reserve mine. The last mentioned sample contained native silver, and the analysis was recalculated, discarding the results obtained for the silver.

Manganiferous Carbonate

The following table contains the results of analyses of the so-called "pink calcite" or dolomite from three mines. The anlyses were made by Mr. N. L. Turner, who says that the pink color is due, in all probability, to manganese, each sample showing distinct traces of this metal. The mineral can therefore be called manganiferous dolomite. It is interesting to know that a similar pink dolomite was found with the ores of Silver Islet and in other silver veins in the Port Arthur area. Ingall says: "Other salient features were the pink and cream-colored dolomitic spar, which so frequently formed a characteristic and prominent constituent of the gangue of the rich ore," and further: "Among these are the gangue minerals, calcite, quartz and dolomite, the latter varying in color from cream to pink according to the amount of manganese contained. . . . rhodochrosite is said to have been found."[15]

	1	2	3	4
Calcium carbonate	55.05	59.65	62.68	77.80
Magnesium carbonate	36.63	30.98	32.89	15.67
Manganese carbonate	.68	.25	.46	.88

1 Temiskaming mine, 3rd level. 2. O'Brien mine. 3. O'Brien mine. 4. Hargrave mine.

Since normal dolomite contains 54.35 per cent. of calcium carbonate and 45.65 of magnesium carbonate, and all the above analyses contain a higher percentage of calcium carbonate, the mineral is more properly called a manganiferous calcium-magnesium carbonate than a dolomite.

ARAGONITE

Dr. T. L. Walker kindly gave me the following note on the occurrence of aragonite at the Cobalt Lake mine:

"This mineral was observed on some specimens of the ore from the Cobalt Lake mine presented by the manager of the mine to Dr. A. P. Coleman, who gave me the material to examine. The chief part of the gangue is calcite, with a considerable amount of fine wire silver. The central part of the vein is drusy, the cavities being lined with wire silver, calcite crystals and fine radiating masses of delicate white crystals. These radiating masses of aragonite are not transparent but rather porcelainic in appearance. An examination showed that the mineral dissolves in hydrochloric acid, and has a specific gravity of about 2.90. Examined under the microscope the small crystals are transparent and extinguish parallel to the cross hairs. Crystallographically the mineral occurs in very slender acicular forms such as have been frequently observed for aragonite. The crystals are not suited for detailed measurements."

15. E. D. Ingall. An. Report. Geo. Sur. Can. Part H., 1887.

Bureau of Mines Specimens

Among the specimens secured from time to time by the Bureau of Mines for its collection, illustrative of the ores and rocks of Cobalt, three or four are worthy of special mention:

Trethewey Mine.—Through the courtesy of Mr. W. G. Trethewey, in the early years of Cobalt, a sample was obtained of the richer ore from his vein on location J B 7, since known as the Trethewey mine. This sample weighs 79 lb. Its length is 2 ft., average width about 8 inches, and average thickness 1½ to 2 inches. Drillings, obtained by boring into the sample, show it to have the following composition. The calcium and magnesium carbonate represent the veinstone. The cobalt and nickel exist as arsenides, and the silver is essentially in the metallic form. Some of the iron shown in the analysis may have come from the drill.

Fig. 18.—Slabs of silver from the Trethewey Mine, location J B 7. The slab standing upright is the 79-pound specimen referred to in the text.

	Per cent.
Silver	66.67
Cobalt	2.15
Nickel	.41
Iron	1.60
Arsenic	7.03
Antimony	9.67
Sulphur	.22
Calcium carbonate	6.72
Magnesium carbonate	1.23
Insoluble	3.29

The value of the silver in this 79-lb. sample, at 54 cents an ounce Troy, is $410.

Crown Reserve Mine.—The specimen from this mine in the collection consists of a block of ore about 2 feet in diameter, weighing 1,259 lb. The fine silver content was determined by specific gravity to be 2,454 Troy ounces. The value of the specimen at

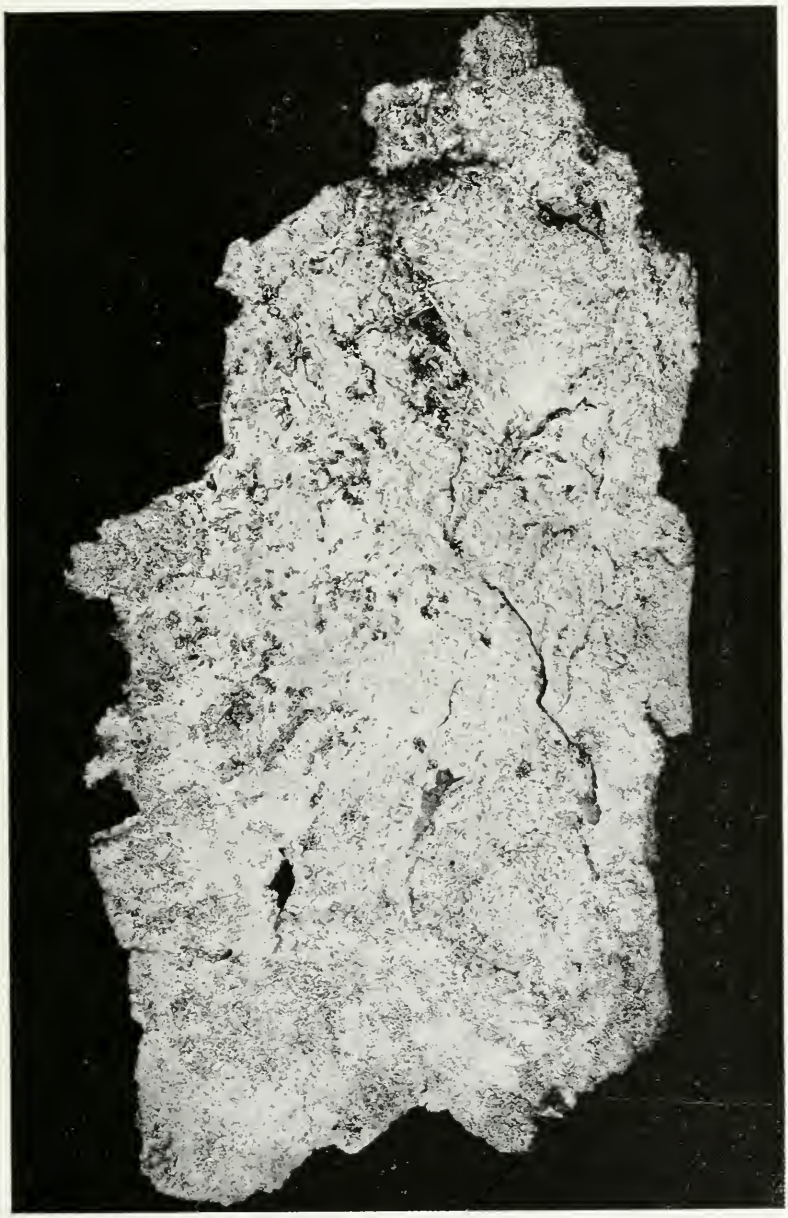


Fig. 19.—Coniagas Sample.

the time of purchase, October, 1908, silver at 51.25 cents an ounce, was $1,257.85. The ore consists essentially of native silver and calcite, together with a small included block of Cobalt slate-like greywacké. The specimen shows the vein at the point from which it was taken to have had a width of over 2 feet, which is large for a Cobalt vein. The specific gravity is 3.84.

Gem Claim.—What may be called a somewhat irregular slab of ore, 5 feet in length by 2 feet in width and about 1 foot thick, was found in the loose, glacial deposits when prospecting on this claim. It weighs 1,640 lb. and contains, by specific gravity determination, 9,715 Troy ounces of fine silver. At the time of purchase, January, 1910, the value of the specimen was approximately $5,000, silver then being worth 52.25 cents an ounce.

While the Trethewey and Crown Reserve specimens are of fresh ore blasted out of the vein, the Gem specimen represents material weathered out and transported by natural agencies. The specimen contains considerable rock, Cobalt greywacké, and calcite. Its surface is well coated with the delicately colored cobalt bloom. The metallic constituents are native silver and dyscrasite. The ore resembles some of that of the Kerr Lake mine, which lies 3,000 feet to the east of north of the Gem claim. It would appear that the specimen was carried from what is now this mine by glacial agency. It may be added that numerous nuggets and chunks of cobalt-silver ore have been found in trenching in the area to the south of the productive Cobalt area.

Coniagas.—One of the most beautiful specimens in the Bureau of Mines collection is a slab or sheet of essentially native silver, approximately 32 inches long, 14 inches wide, and one-half to 1 inch thick. This specimen weighs 37 lb. avoirdupois and at the time of its purchase, November, 1911, was valued at $350. The sample came from the 150-foot level of vein No. 12, Coniagas mine. (Fig. 19.)

Exhibit of Cobalt-Silver Ores

Through the Bureau of Mines, arrangements were made for securing a collection of the cobalt-silver ores for exhibition at the Louisiana Purchase Exposition, held at St. Louis in 1904. These were obtained at the request of Mr. William Hutchison, Dominion Exhibition Commissioner, who has since purchased the samples exhibited, with the object of keeping them as a permanent exhibit. They were afterwards sent to the Liege Exhibition, Belgium, and elsewhere.

The following notes given to the writer by Mr. W. E. H. Carter, late Provincial Inspector of Mines, show the composition and character of the exhibit. While the exhibit was at St. Louis it was sampled by Mr. Carter, who has this to say of the various specimens: "The niccolite contains silver not only disseminated but in pure stringers and nuggets as well. These nuggets and stringers were not included in the sample taken for analysis, but should be considered as adding materially to the value of the ore represented by my sample.

"I. Cobalt-Silver Ore, Sample from R L 404:

(*a*) 50 lb. decomposed material with silver, containing by estimate 30 p. c. silver, which amounts to 218 oz., and at 55c. per oz....	$119 90
(*a*) 14 pieces, wall rock with silver (*b*) 61 pieces cobalt ore ..... } 75 pieces weighing 6,510 lb.	
This 6,510 lb. contains by assay:	
Silver, 2.58 oz. per ton, at 55c.	$4 62
Cobalt, 18.04 p. c.—1,174.4 lb., at 65c.	763 36
Nickel, 5.52 p. c.—359.35 lb., at 15c.	53 90
Arsenic, 39.56 p. c.—791.2 lb., at 1c.	7 91
Total value of sample	$949 69

(*a*) From Little Silver vein, southwest corner of location R L 404.
(*b*) From Cobalt Hill vein, in northwest corner of the same location.

"II. Niccolite-Silver Ore, from La Rose mine, Location J S 14 on map:
Containing by assay:

	Value per ton.
Silver, 7.944 p. c.—2,317 oz. per ton, at 55c	$1,274 35
Cobalt, 8.93 p. c.—178.6 lb., at 65c	116 09
Nickel, 15.67 p. c.—313.4 lb., at 15c	47 01
Arsenic, 39.56 p. c.—791.2 lb., at 1c	7 91
Total per ton	$1,445 36
There are about three tons in the sample	4,336 08

"III. Trethewey's Cobalt-Silver Ore, Location J B 7 on map:
145 lb. in all. Of this, 15 lb. is by estimate pure silver—212 oz.—and at 55c. $116 60
And 130 lb. is cobalt ore containing silver, and valued at $1.50 per lb. 195 00

Total value $311 60

"In valuing the above ores I have taken the prices paid by the dealers at New York for the crude ore, which are as follows for the several metals:

Silver . . . Market value.
Cobalt . . . 65c. per lb.
Nickel . . . 15c. per lb.
Arsenic . . . 1c. per lb.

The value of these samples of ore, which are to be kept for exhibition purposes, is approximately as follows:

(1) Sample of cobalt-silver ore from R L 404, weight 6,560 lb., value $949 69
(2) Niccolite-silver ore from La Rose mine, exact weight not given, but if it is three tons, as stated, the value of the sample is 4,336 08
(3) Trethewey cobalt-silver ore, 145 lb. in all, value 311 60

Total value of collection $5,597 37

The cobalt is contained essentially in the mineral smaltite, which is a diarsenide of this metal. Most of the nickel in the samples occurs as the arsenide, niccolite, but some of the metal is in the diarsenide form, chloanthite. The greater part of the silver is in the native form, although the sulphide, argentite, the sulph-antimonide, pyrargyrite, and other compounds of the metal are found in the deposits.

Character of Cobalt Ores

To the foregoing description of the minerals of the veins and of specimens of ore a few notes may be added concerning shipments. This will bring out still more clearly the great richness of the vein contents.

Additional notes on the richness of the ores, and the cost of producing silver, will be found on a following page.

1904.

The character of the ore produced in 1904, when mining began, will be seen from the following:

Silver, ounces	206,875	$111,887 00
Cobalt, tons	16	19,960 00
Nickel, tons	14	3,467 00
Arsenic, tons	72	904 00
Total		$136,218 00

Ore shipped, 158 tons; value per ton, $862.13.

This gives the following average percentage of the four metals in the ore shipped.

Silver	5.34	per cent. or 1,309.33 ounces per ton
Cobalt	10.21	" "
Nickel	8.86	" "
Arsenic	45.56	" "

1905.

The production for the first quarter year ending March 31st, 1905, during which shipments were made, was 354.05 tons of ore, valued at $293,552. The ore thus averaged $829 a ton. The average percentage of the metals in the ore was as follows:

	Per cent.
Silver	4.802
Cobalt	8.264
Nickel	4.739
Arsenic	34.606

The 4.802 per cent. of silver represents 1,406.27 ounces a ton. The cobalt, nickel and arsenic in one carload are not included, no returns having been made.

During the second quarter, March 31st to June 30th, 1905, the shipments were 537 tons, valued at $394,552, or an average of $734 a ton.

The average percentage of the metals in the ore for this quarter was:

	Per cent.
Silver	4.158
Cobalt	6.890
Nickel	3.091
Arsenic	30.912

The metals in the ore were sold at approximately the following prices: Silver, 55 to 60 cents an oz. Troy for 90 per cent. of the contents; cobalt, 65 cents; nickel, 12 to 15 cents, and arsenic about 1 cent a pound.

During the first quarter of the year there were four companies or individuals who made shipments. During the second quarter small shipments were made from one or two other properties. During the second half of 1905 there were seventeen shippers.

During the second half of the year, owing to there being no plants in America adapted to extracting all the constituents of the ores, the mine owners received, in some cases, no pay for the cobalt, nickel and arsenic contents, the purchasers allowing for the silver only. For this reason the statistics of production received by the Bureau of Mines are incomplete, complete analyses not having been made of some shipments. In compiling the following table the average of the cobalt, nickel and arsenic contents in the shipments analyzed has been taken, and proportionate percentages, based on the silver, in the shipments of which complete analyses were made, has been added to those which were incompletely analyzed.

Owing to their receiving nothing for some of the metallic contents of the ores, if sold during the latter half of the year, the producers had stored at their mines on December 31st, 1905, the end of the year represented by the statistics, a considerable quantity of ore. In two or three cases the quantity in storage represented a value of $100,000 or more. The following table, therefore, does not represent the total production for 1905, but merely the shipments:

	Quantity.	Value.
Tons of ore shipped	2,144	
Silver, ounces	2,441,421	$1,355,306
Cobalt, tons	118	100,000
Nickel, tons	75	10,525
Arsenic, tons	549	2,693

The 2,144 tons of ore shipped during the year had therefore a percentage composition of:

Silver	3.90
Cobalt	5.50
Nickel	3.49
Arsenic	25.60

A percentage of silver of 3.90 represents 1,138.72 ounces a ton, or at 64 cents an ounce, the then price of silver, a value of $728.78 a ton of ore throughout the year. It is needless to say that the average value of the ore shipped from few mining camps can equal this. The average value of the total metallic contents per ton of ore shipped throughout the year 1905, at the prices received, was $684.94. It should be noted that most of the ore mined during the year came from near the surface. Hence the percentage of cobalt, nickel and arsenic is lower than when greater depth is reached, the metals being leached out by surface agencies.

The ore shipped till near the end of 1907 was sorted by hand. Since then extensive concentrating plants have been erected. These plants are described in other reports.[16]

Production of Cobalt Mines, 1904-1912

The following table summarizes the production of the Cobalt and adjacent areas.

Year	Ore shipped	Nickel		Cobalt		Arsenic		Silver		Total value
	Tons	Tons	Value	Tons	Value	Tons	Value	Ounces	Value	
			$		$		$		$	$
1904	158	11	3,467	16	19,960	72	903	206,875	111,887	136,217
1905	2,144	75	10,000	118	100,000	519	2,693	2,451,356	1,360,503	1,473,196
1906	5,335	160	.....	381	80,704	1,440	15,858	5,401,766	3,667,551	3,764,113
1907	14,788	370	1,174	739	104,426	2,958	40,104	10,023,311	6,155,391	6,301,095
1908	25,624	618	.....	1,284	111,118	3,672	40,373	19,437,875	9,133,378	9,284,869
1909	30,677	766	.....	1,533	94,965	1,294	61,039	25,897,825	12,461,576	12,617,580
1910	34,282	504	.....	1,098	54,699	1,897	70,709	30,645,181	15,478,047	15,603,455
1911	26,653	392	.....	852	170,890	3,806	74,609	31,507,791	15,953,847	16,199,346
1912	29,173*	.....	.....	515	317,165**	1,964***	79,297	30,213,859	17,408,935	17,805,397
Total	.....	.....	.....	.....	.....	.....	.....	155,845,839	81,731,115	83,185,268

The average value of the ore shipped during the first three years was $704 per ton. For the first year, when only very rich material left the camp, the ore averaged $862 per ton; in 1905, when a large quantity of low-grade gravel was included in the shipments, it fell to $687 per ton; while in 1906, the average went up to $705 per ton, practically identical with the average for the whole period. A considerable proportion of the consignments in 1906 was also of second or third class quality, but on the other hand there were many carloads of unusual richness. The percentage of low grade ore shipped in 1907 showed an increase. Concentration plants erected since then have brought about the treatment of most of the low-grade ore at Cobalt.

16 Part I. of the annual report of the Bureau of Mines, and Mr. A. A. Cole's annual reports to the T. N. O. Railway Commission.

*Does not include ore refined at Cobalt. **Cobalt oxide, etc. ***Refined.

Mines, Concentrating and Refining Plants and Water Power

The working mines of Cobalt and adjacent silver areas are described in Part I of the Annual Reports of the Ontario Bureau of Mines, and in the Annual Reports of Mr. A. A. Cole to the Temiskaming and Northern Ontario Railway Commission. Descriptions of the concentrating, refining and water power plants are to be found in the same reports and in the technical press.

The tendency towards final treatment of the ore in the camp is manifested in the increased shipments of bullion, consignments of which amounted to 5,071,897 ounces in 1912 as against 3,132,976 ounces in 1911. The Nipissing and Buffalo mines are now equipped for reducing their entire output to merchantable bars on the spot. Nevertheless, the tonnage of ore and concentrates shipped to outside points in 1912 was larger than in 1911, the respective quantities being 17,959 tons ore, and 11,214 tons concentrates, as compared with 17,278 tons ore, and 9,375 tons of concentrates in 1911. The year of largest shipments was 1910, when 27,437 tons ore and 6,845 tons concentrates left the camp.

The largest producers during 1912 were as follows:

	Silver.
Nipissing	4,680,670 ounces.
Coniagas	3,703,942 "
La Rose	2,920,344 "
Crown Reserve	2,714,765 "
McKinley-Darragh-Savage	2,694,560 "
Kerr Lake	1,895,309 "
Buffalo	1,890,150 "
Cobalt Townsite	1,505,396 "
Temiskaming	1,217,994 "
O'Brien	1,091,631 "

In Gowganda, in 1912, three mines—Miller Lake-O'Brien, Milleret and Mann—produced in all 549,976 ounces, and in South Lorrain one—Wettlaufer-Lorrain—834,119 ounces. Casey township has also become an important producer.

In 1912, as in previous years, the larger proportion of the high-grade ore and concentrates produced at Cobalt was treated in refineries situated in Ontario, the principal works being those at Copper Cliff, Deloro, Thorold and Orillia. At Deloro and Thorold, also at a small refinery opened during the year at North Bay, the oxides of cobalt and nickel are produced and large shipments made, both of refined cobalt oxide and of the mixed oxides of cobalt and nickel, to the United States and European markets. Another by-product turned out by the refineries is white arsenic, of which nearly four million pounds were made during the year. The Cobalt plant at Copper Cliff is now permanently closed.

There was paid out in dividends by silver mining companies in the Cobalt camp over seven million dollars in 1912. The total distribution of profits since the beginning of the camp has been close upon 41 millions of dollars on a gross aggregate return for sales of silver of $81,777,260.

Dividends Declared and Paid by Silver-Cobalt Mining Companies to end of 1912.

Name of Company.	Date of Incorporation.	Authorized Capital.	Capital Stock issued.	Par value per share.	Amount of Dividends and Bonuses declared to end of 1911.	Amount of Dividends and Bonuses declared during 1912.	Total of Dividends and Bonuses declared to Dec. 31, 1912.	Last Dividend or Bonus.	
								Date declared.	Rate per cent.
		$	$	$	$ c.	$ c.	$ c.		
Beaver Consolidated Mines, Limited	Mar. 5, 1907	2,000,000	2,000,000	1.00	170,000 00	180,000 00	350,000 00	Dec. 21, 1912	3
Buffalo Mines, Limited	April 27, 1906	1,000,000	1,000,000	1.00	1,377,000 00	500,000 00	1,877,000 00	Dec. 4, 1912	26
City of Cobalt Mining Company, Limited	Oct. 5, 1906; Jan. 7, 1909	500,000 / 1,500,000	1,500,000	1.00	139,312 42		139,312 42	April 15, 1909	3
Cobalt Central Mines Company	Dec. 13, 1906	5,000,000	5,000,000	1.00	192,845 00		192,845 00	Aug. 25, 1909	1
Cobalt Lake Mining Company, Limited	Dec. 22, 1906	†5,000,000	3,929,166	1.00		75,000 00	75,000 00	Nov. 26, 1912	2½
Cobalt Silver Queen, Limited	April 1, 1906	1,500,000	1,500,000	1.00	315,000 00		315,000 00	Dec. 31, 1908	3
Cobalt Townsite Mining Co., Limited	May 6, 1906	100,000	15,011	1.00	125,000 00	346,000 00	471,000 00	Nov. 1912	324
Coniagas Mines, Limited	Nov. 24, 1906	1,000,000	1,000,000	5.00	2,840,000 00	1,440,000 00	1,280,000 00	Oct. 11, 1912	9
Crown Reserve Mining Company, Limited	Jan. 16, 1907	2,000,000	1,999,957	1.00	3,714,509 10	1,061,288 40	1,775,797 80	Dec. 15, 1912	5
Foster Cobalt Mining Company, Limited	Feb. 14, 1906	1,000,000	915,588	1.00	45,000 00		45,000 00	Jan. 1, 1907	5
Kerr Lake Mining Company	Aug. 9, 1905	3,000,000	3,000,000	5.00	3,940,000 00	670,000 00	4,610,000 00	Oct. 8, 1912	7
La Rose Consolidated Mines Company	Feb. 21, 1907	7,500,000	7,193,135	5.00	2,672,000 00	1,000,546 81	3,672,546 81*	Dec. 16, 1912	5
McKinley-Darragh-Savage Mines of Cobalt, Limited	April 9, 1906	2,500,000	2,217,692	1.00	2,156,721 38	1,123,846 00	3,280,637 38	Nov. 1, 1912	20
Nipissing Mines Company	Dec. 16, 1904	6,000,000	6,000,000	5.00	8,325,797 25	1,842,500 00	10,168,297 25	Dec. 9, 1912	7½
Right of Way Mining Company, Limited	July 13, 1906	500,000	500,000	1.00	321,643 93		321,643 93		
The Right of Way Mines, Limited	Sept. 11, 1909	2,000,000	1,685,500	1.00	202,260 00		202,260 00	Dec. 2, 1911	2
Temiskaming and Hudson Bay Mining Company, Limited	July 29, 1903	25,000	7,761	1.00	1,521,156 00	209,547 00	1,730,703 00		300
The Hudson Bay Mines, Limited	July 16, 1909	3,500,000	3,200,050	5.00	394,903 42	192,003 00	586,906 42	Sept. 20, 1912	3
Temiskaming Mining Company, Limited	Nov. 16, 1906; Jan. 1, 1908	2,500,000	2,500,000	1.00	1,009,156 00	300,000 00	1,309,156 00	Dec. 31, 1912	3
Trethewey Silver Cobalt Mine, Limited	May 30, 1906; June 1, 1911	1,000,000 / 2,000,000	1,000,000	1.00	761,998 50	100,000 00	861,998 50	June 1, 1912	10
Wettlaufer-Lorrain Silver Mines, Limited	Nov. 30, 1908	1,500,000	1,416,590	1.00	283,318 00	283,318 00	566,636 00	Nov. 25, 1912	5
Casey Cobalt**									
Seneca-Superior**									
Total						9,321,049 21	39,834,710 54		

*In addition to profits to owners previous to May 31, 1908, amounting to $1,204,862.72. **Paid dividend, 1913.
†Reduced by shares purchased for cancellation to $1,070,834. Dividends of closely controlled or privately owned properties such as O'Brien, Drummond, Miller Lake-O'Brien and Millerett are not made public.

High and Low Prices of Stocks of Cobalt-Silver Mines

The following table of the annual high and low prices of the stocks of the cobalt-silver mines has been compiled from various sources. Information has been kindly furnished by brokers and by the financial editors of some of the newspapers. While the prices given in the table vary in a few cases from those published in certain lists, they are as nearly correct as it seemed possible to make them. Data for the individual years 1906 and 1907 being incomplete, the highest and lowest prices to the end of 1907 are given. The records for 1908 and succeeding years are more complete.

The capitalization of the companies mentioned is given in the preceding table of dividends. Stock in many other companies was sold, but the table is confined to those which are of the most interest.

Name of Company.	To end of 1907		1908		1909		1910		1911		1912	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Beaver or Beaver Consolidated Mines, Limited..	.88	.20	.66½	.24	.44	.9½	.38½	.18	.52	.85½	.50	.39
Buffalo Mines, Limited	5.00	.80	3.62½	2.15	3.60	2.50	2.50	1.96	2.30	1.40	2.50	1.20
City of Cobalt Mining Company, Limited....	2.83	2.38	2.80	1.75	2.81	.33	.55½	.19½	.21	.05½	.36½	.07
Cobalt Central Mines Company	.76	.16½	.74	.21	.58½	.24	.23	.06	.10	.01	.01	.0½
Cobalt Lake Mining Company, Limited.....	.85	.09	.25⅝	.10	.19½	.11½	.29¾	.12¼	.29¾	.12¾	.59	.17
Cobalt Silver Queen, Limited	3.50	.62	1.28	.721	1.00	.19	.23	.04⅜	.10	.02	.07¼	0.03
Coniagas Mines, Limited	8.50	3.30	7.20	3.90	7.00	5.25	6.00	4.19	7.60	6.00	8.25	6.70
Crown Reserve Mining Company, Limited....	3.10	.20	2.88	.38	5.99	2.63	4.10	2.52	3.60	2.38	3.60	2.00
Foster Cobalt Mining Company, Limited.....	4.37	.35	.89	.38	.70⅜	.22	.31	.04	.07	.02½	.19¼	.03
Kerr Lake Mining Company, Limited	7.80	2.55	7.80	2.60	9.43	7.60	11.00	6.00	7.75	2.70	3.15	2.55
La Rose Consolidated Mines Company.....	.....	.....	7.12½	6.08	8.47	4.20	5.02	3.30	5.00	3.70	4.01	2.10
McKinley-Darragh-Savage Mines of Cobalt, Ltd.	4.12	.64½	1.30	.64½	1.01	.84	1.40	.79½	1.88	1.29	2.20	1.60
Nipissing Mines Company.....	34.25	5.50	12.63	6.12	12.91	9.25	11.75	9.50	11.25	6.60	9.35	5.78
Right of Way Mining Company, Limited ..	10.50	1.00	4.00	3.65	3.70	1.30	.31	.20	.29¾	.04½	.13	.05
The Right of Way Mines, Limited												
Temiskaming and Hudson Bay Mining Company, Limited ..	.....	.....	.....	.....	290.	148.	143.	98.	108.	80.	90.	63.
The Hudson Bay Mines, Limited												
Temiskaming Mining Company, Limited.....	2.25	.26	2.00	.28½	1.79	.67	.98	.52	.92	.25½	.49	.30
Trethewey Silver Cobalt Mine, Limited	2.85	.46	1.80	.47	1.64	1.29	1.45	1.13¼	1.22	.51	.77	.31
Wettlaufer Lorrain Silver Mines, Limited	.....	.....	.....	.....	.....	.....	1.42	.52	1.23	.75	.83	.23

Silver Production of the World*

(In fine ounces)

	1911	1912**
Mexico	79,032,440	76,500,000
United States	60,399,400	62,369,903
Canada	32,740,748	31,931,710
Australasia	16,578,421	17,950,000
Other Countries	36,621,835	37,500,000
Total	225,372,844	226,251,013

*From Eng. and Min. Jour., Jan. 11th, 1913. **Subject to revision.

Production of Silver in World since 1871

Annual Average for Period

Period	Fine Ounces	Coining Value
1871–75	63,317,014	$81,864,000
1876–80	78,775,602	101,851,000
1881–85	92,003,944	118,955,000
1886–90	108,911,431	140,815,000
1891–95	157,581,331	203,742,000
1896–1900	165,693,304	214,229,700
1901	173,011,283	223,691,309
1902	162,763,483	210,441,900
1903	167,689,322	216,810,300
1904	164,195,266	212,292,900
1905	172,317,688	222,794,500
1906	165,054,497	213,403,800
1907	184,206,984	238,166,600
1908	203,131,404	262,634,500
1909	210,453,431	272,101,400
1910	222,879,362	288,167,300
1911	225,372,844	
1912	226,251,015*	

* Subject to revision.

United States Silver Production

(Fine Ounces)

	1911	1912*
Alabama	200	237
Alaska	408,300	516,224
Arizona	3,228,900	3,456,989
California	1,270,900	1,255,192
Colorado	7,331,200	8,350,316
Georgia	600	65
Idaho	8,184,900	7,703,721
Illinois	4,000	3,740
Maryland and Pennsylvania	100	201
Michigan	507,700	543,360
Missouri	49,100	25,311
Montana	12,163,900	12,338,589
Nevada	13,185,900	13,042,118
New Mexico	1,341,400	1,251,412
North Carolina	1,000	3,783
Oregon	44,800	79,896
South Carolina	.....	40
South Dakota	200,300	200,796
Tennessee	107,000	109,773
Texas	444,200	420,994
Utah	11,630,600	12,795,072
Virginia	200	7,974
Washington	230,300	258,152
Wyoming	700	298
Total Continental U.S.	60,395,917	62,364,253
Philippine Islands	3,000	5,650
Porto Rico	100	.....
Total	60,399,400	62,369,903
Total Value	$32,195,296	$37,942,773

* Subject to revision.

Monthly Average Price of Silver

Month.	New York.			London.		
	1910	1911	1912	1910	1911	1912
January	52.375	53.795	56.260	24.154	24.865	25,887
February	51.534	52.222	59.043	23.794	24.081	27,190
March	51.454	52.745	58.375	23.690	24.324	26,875
April	53.221	53.325	59.207	24.483	24.595	27,284
May	53.870	53.308	60.880	24.797	24.583	28,038
June	53.462	53.043	61.290	24.651	24.486	28,215
July	54.150	52.630	60.654	25.034	24.286	27,919
August	52.912	52.171	61.606	24.428	24.082	28,375
September	53.295	52.440	63.078	24.567	24.209	29,088
October	55.490	53.340	63.471	25.596	24.594	29,299
November	55.635	55.719	62.792	25.680	25.649	29,012
December	54.428	54.905	63.365	25.160	25.349	29,320
Year	53.486	53.304	60.835	24.670	24.592	28,842

New York quotations, cents per ounce Troy, fine silver; London, pence per ounce, sterling silver, 0.925 fine. The table is taken from Eng. and Min. Jr., Jan. 11th, 1913.

Coined silver in the United States on January 1, 1913, is estimated as follows: Standard dollars, $565,481,020; subsidiary coins, $174,538,163; total, $740,029,183.

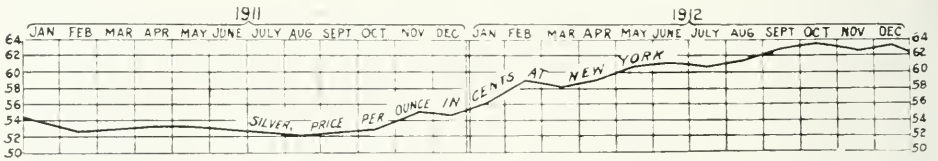


Fig. 20, Monthly average price of silver, 1911 and 1912.

Average Price of Bar Silver in London since 1833

(The equivalent in United States Gold Coin of one ounce 1,000 fine.)

	Dollars.		Dollars
1833	1.297	1859	1.3600
1834	1.313	1860	1.3520
1835	1.308	1861	1.3330
1836	1.315	1862	1.3460
1837	1.305	1863	1.3450
1838	1.304	1864	1.3450
1839	1.323	1865	1.3380
1840	1.323	1866	1.3390
1841	1.316	1867	1.3280
1842	1.303	1868	1.3260
1843	1.297	1869	1.3250
1844	1.304	1870	1.3280
1845	1.982	1871	1.3260
1846	1.300	1872	1.3220
1847	1.308	1873	1.29769
1848	1.304	1874	1.27883
1849	1.309	1875	1.24233
1850	1.316	1876	1.16414
1851	1.337	1877	1.20189
1852	1.326	1878	1.15358
1853	1.348	1879	1.12392
1854	1.348	1880	1.14507
1855	1.344	1881	1.13229
1856	1.344	1882	1.13562
1857	1.353	1883	1.10874
1858	1.344	1884	1.11068

	Dollars		Dollars
1885	1.06510	1899	.60154
1886	.99467	1900	.62007
1887	.97946	1901	.59595
1888	.93974	1902	.52795
1889	.93511	1903	.54257
1890	1.04634	1904	.57876
1891	.98800	1905	.61027
1892	.87145	1906	.67689
1893	.78030	1907	.66152
1894	.63479	1908	.53490
1895	.65466	1909	.52016
1896	.67565	1910	.54077
1897	.60438	1911	.53304
1898	.59010	1912	.60835

Cobalt

The production of cobalt from the mines at Cobalt and surrounding areas much exceeds the consumption of the finished oxide, and new uses must be found for the metal or its compounds before the industry can expand. The price of cobalt oxide is only about one-third what it was a few years ago. At present the principal use, as it has been for centuries, is in the making of pottery and glass. It is said that glass colored with cobalt has been found in the ruins of Troy and in the graves of the ancient Egyptians. An account of the early cobalt industry in Saxony will be found in an appendix to this report.

The world's consumption is estimated at 300 tons of cobalt oxide annually. Sufficient ore is produced at Cobalt to provide 1,500 tons or more annually.

The trade in cobalt oxide has been closely controlled. The price in 1912, according to the *Engineering and Mining Journal*, was held at 80 cents per lb. without change. An increase of 10 cents per lb. has been announced for 1913.

Continued successful experiments with cobalt as an alloy of tin or chromium to produce special metals for cutlery and other purposes, and with cobalt salts as paint driers, have been made.

Cobalt Oxide, Ore and Zaffer Imported into the United States for Consumption, 1901-11 in pounds.*

Years.	Quantity.	Value.
1901	71,969	$134,208
1902	79,984	151,115
1903	73,350	145,264
1904	42,354	86,925
1905	70,048	139,377
1906	41,084	83,167
1907	48,013	74,849
1908	219,098	17,077
1909	12,132	11,696
1910	14,935	6,352
1911	579,520	48,104

Arsenic, Production and Uses

The Ontario production of arsenic from the Cobalt mines is summarized on a preceding table, page 35.

With the withdrawal, in 1912, of the Canadian Copper Company from the treatment of Cobalt ores, the Deloro Mining and Reduction Company and the Coniagas Reduction Company are now the only producers of white arsenic in Canada.

*Min. Res. U.S., 1911, Part I., p. 959.

Not many years ago Deloro had the only plant for the production of white arsenic in North America, the ore then treated being the auriferous mispickel mined at the plant. Since then the industry has made marked progress in the United States, the producers now being the Anaconda Company, the American Smelting and Refining Company, and the United States Smelting Company. There is also a plant in Virginia. Moreover, some of the large sulphuric acid makers are said to be marketing arsenious sulphide derived as a by-product in refining acid.

There is no duty on arsenic and its compounds going into the United States.

The Compania de Penoles is the only producer in Mexico. The plant is worked on flue dust.

The Following Table gives the World's Production of Arsenic in Metric Tons:

Year	Canada (a)	Germany (b)	Italy (d)	Japan (a)	Portugal (d)	Spain (a)	United Kingdom (a)	United States (a)	France (d)
1909.....	1,020	2,911	nil	8	1,420	506	2,911	914	2,381
1910.....	1,363	3,066	nil	12	974	444	2,187	1,203	2,141
1911.....	1,902	2,981	16	.....	(c)	(c)	2,178	2,800	(c)
1912.....	1,964	.....	.....	.....	.....	.....	.....	2,655	.....

(*a*) White arsenic. The arsenic in the ores shipped from Cobalt during each of the three years, 1909-1911, was 4,294, 4,897, and 3,806 tons respectively. (*b*) Oxide, sulphide, etc.; (*c*) not yet available; (*d*) ore.

The annual production of the arsenical ores, orpiment and realgar, in China, is estimated at 600 tons.

Within the last few years there has been a great expansion in the manufacturing of arsenical products, especially insecticides.

The imports of white arsenic into the United States are given as 8,204,123 pounds in 1910, and 6,916,069 in 1911.

The price of arsenic materiallly increased during 1912. At the beginning of the year it was 1⅞ to 2 cents per lb. At the close it was about 4⅞ cents.

The uses for arsenical compounds are numerous and the market for them is increasing, especially in connection with agriculture. Much of the Canadian arsenic has been sold to plate glass manufacturers in the United States.

The following is a summary of the uses to which is put white oxide, the material produced at the Canadian refining plants.*

Arsenious oxide, or white arsenic, is used as an insecticide; in the preservation of furs and leather; also as a preservative of wood, where it prevents the fungus growth. The most important demand for arsenic is in the manufacture of Paris green, this product being employed as an insecticide. Arsenic is also extensively used as a fixing medium, or mordant, in connection with aniline dyes, and in printing of calico and wall-paper. Among the important colors in which arsenic is used are Scheele green, London purple, and in certain yellows, reds and grays. Arsenic is also used in the manufacture of glass and enamel; it also finds a small use in medicine. Arsenic soap is another familiar use. Realgar, which is an arsenic sulphide, burns with a bright white light and is used in the manufacture of pyrotechnics. Arsenic hardens lead and finds employment in this connection in the manufacture of shot.

*Min. Ind., Vol. XVII, p. 54.

United States Production and Imports of Arsenic, 1902-1911.*

Year.	Production of White Arsenic.		Imports. (a)			
			White arsenic, metallic arsenic, and arsenic sulphides.		Paris green and London purple.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	(short tons)	$	(short tons)	$	(short tons)	$
1902.....	1,353	81,180	4,055	280,055	.....	.....
1903.....	611	36,691	4,179	294,602	.....	.....
1904.....	36	2,185	3,400	243,380	28,498	985
1905.....	754	35,210	3,838	256,540	44,931	1,118
1906.....	737	63,460	3,987	350,045	311,293	21,347
1907.....	1,751	163,000	5,164	574,998	133,422	21,919
1908.....	(b)	.....	4,964	430,400	195,000	30,764
1909.....	1,214	52,946	4,036	303,728	183,765	20,370
1910.....	1,497	52,305	5,139	314,306	181,363	14,648
1911.....	3,132	73,408	4,096	247,323	126,191	4,972

(a) Figures furnished by the Bureau of Statistics.

(b) There were only two producers of arsenic in the United States in 1908, so that the figures of production may not be given.

Bismuth

While native bismuth is found at times in considerable quantity, and the compounds of the metal to a lesser extent, in the cobalt-silver ores, the mining companies have received no pay for it. No bismuth refined from Cobalt ores has been reported as having come on the market.

The bismuth business of the world is in the hands of the European convention, which for many years has monopolized production. The convention's price during 1912 remained at 7s. 6d., London, which was the same as in 1911.**

Only in the United States is there any independent production of bismuth worth mentioning. Here, the United States Smelting and Refining Company produces a relatively small quantity out of the Betts process slimes. This American producer keeps its output within such limits as enable it to market all at a little under the convention's price, without inciting a trade war, which probably neither party wants. The quotation for bismuth in the United States in 1912 was $1.72 per lb. throughout the year.

In 1913 there will be a new producer, viz., the American Smelting and Refining Company, which is to refine the metal at its Omaha plant. Experiments are also said to have been made in the production of the metal at Chrome and Perth Amboy, N.J., but no sales were reported from these plants in 1912.

Imports for Consumption of Metallic Bismuth into the United States, 1904-11, inclusive, in pounds.***

Year.	Quantity.	Value.
1904.....	185,905	$339,058
1905.....	148,589	318,007
1906.....	254,733	318,452
1907.....	259,881	325,015
1908.....	164,793	257,397
1909.....	183,413	286,516
1910.....	198,174	332,668
1911.....	172,093	311,771

*Min. Res. U.S., 1911, Part II, p. 855. **Eng. and Min. Jour. Jan. 11th, 1913. ***Min. Res. U.S., 1911, Part I, p. 976.

Fig. 20. Keewatin greenstones in the foreground, covered by conglomerate and slate-like greywackè of the Cobalt series, which is capped by the Nipissing diabase sill. The photograph was taken from the hill at the McKinley-Darragh mine, the camera pointing easterly.

THE ROCKS AND THEIR RELATIONSHIPS

At first, owing to the surface being covered with green timber and to the presence of much drift material, contacts and good exposures were difficult to find. Facilities for mapping have been much better during late years, as mining has progressed and the timber has been removed.

From the maps which accompany this Report it will be seen that there is considerable variety in the pre-Cambrian series. The Niagara of the Silurian system also shows prominent outcrops. Between the Niagara and the Pleistocene or Glacial there are no formations represented in the district.* The author is indebted to Mr. Cyril W. Knight for many of the descriptions of rocks on following pages.

The following table shows the subdivisions, based on age relations, that have been made among the rocks of the Cobalt area proper. Representatives of most of these subdivisions of the pre-Cambrian are found in other areas that have been carefully mapped in the surrounding region.

In the Porcupine gold area, one hundred miles to the northwest of Cobalt, the Keewatin and Temiskaming series are prominent. The Cobalt series is also present in this area, and certain dikes are believed to represent the Nipissing diabase of Cobalt.

In the Gowganda area, which lies fifty miles to the west of Cobalt, the Nipissing diabase and Cobalt series occupy much of the surface. The Temiskaming series is found in good exposures in part of the area. The latter series has also been found at Swastika and Larder Lake, at Abitibi Lake, 75 miles north of Cobalt, and eastward across the boundary in Quebec. It is thus known to occur at various points over a large region. (Fig. 21, map.)

It is possible that unconformities that have not been discovered exist in the pre-Cambrian of the Cobalt and adjacent areas. Moreover, the relationship which the

*Sir William Logan (then Mr. Logan) explored Lake Temiskaming in 1845-6. The account of his trip, published in the report of the Geological Survey for those years, pages 60-70, is of interest.

"Ascending Lake Temiscamang, the slates come in upon the gneiss about three miles below the mouths of the Montreal and Metabecchuan Rivers, on the west bank, and about three miles above them on the east; and they occupy both sides to within two and a half miles of the Hudson Bay Company's Post. In this distance they may have a direct breadth of about seven miles in which they are effected by at least one undulation, and probably more, and constitute hills of 300 to 400 ft. As gathered from the map of Mr. D. Taylor's exploratory journey from Lake Huron to the Ottawa by Lakes Nipissing, Temagamang and Temiscamang, the slates in a westerly direction run forty miles in a line about S. 40° W., from the latter Lake to Bass Lake, on the Sturgeon River, which discharges into Lake Nipissing on the north side, and it appears probable they will come upon some part of the north shore of Lake Huron. On Lake Temiscamang they are followed by the sandstones, which cross the lake with a strike of N. 60° E., and dipping northward at a very small angle, after having been piled up into a range of about the same elevation as the slate hills, they reach the Company's Post, where, nearly flat, they run under a narrow gravel hill, 130 feet in height; emerging beyond, they continue to a distance of about half a mile above the Post, and there become interrupted on both sides of the lake by a mass of syenite. This syenite does not possess the gneissoid arrangement of the rock lower down the river, but it appears to be nearly similar in other respects, being composed of reddish feldspar, white or colorless quartz and a sparing quantity of green hornblende. The breadth of this syenitic band is pretty nearly three miles on both sides of the lake. On the west it is succeeded by the sandstones, which run along the coast for a distance of four miles, nearly in the strike of the measures, dipping towards the water at a small angle, and are followed by the slates, which come from behind them, and continue in a straight line for nine miles to the western bay at the head of the Lake, forming high, perpendicular cliffs for part of the way, and rounded hills for the remainder. On the east side, the syenite gives place to the slates, which there present the porphyritic appearance already mentioned. The sandstones come upon them on the south side of the southern large island, and the mainland near, dipping a little to the west of north at an angle of three degrees; and both they and the slates, with their associated conglomerates, make their appearance at occasional points along the coast, wherever denuded of the overlaying limestones the basset edge of which thinly covers them, to the island at the entrance of the eastern or Moose River Bay. Beyond this the sandstones, gently dipping south, are seen in a projecting point to the east of the island. The slates are met with at the mouth, and at the first, second and third portages of the Riviere des Quinze, or Moose River, and their associatiated conglomerates in the bay to the west of the Blanche.

"The limestones constitute the two large islands north of the Company's Post, the two smaller ones between them, the island already mentioned planted at the entrance of the eastern bay, and a very small one on the west coast, as well as the promontory which separates the east bay from the west. The strata lie in the form of a shallow trough, based sometimes on the sandstones and sometimes on the slates, occupying the breadth of the lake,—from five to six miles—and extending from the south side of the southern great island to some unknown distance northward, being probably either a projecting point or an outlier of some more extended calcareous area nearer Hudson's Bay."

Cobalt and Temiskaming series have to the fragmental rocks of the classic Huronian area of the north shore of Lake Huron is not known. Hence, in the following table the name Huronian is not employed, although elsewhere in the report the name is applied in a general way to the Cobalt series. If the Huronian is considered to include all the post-Laurentian and pre-Keweenawan fragmental rocks of the region, then both the Cobalt and Temiskaming series come under this heading.

As shown by the accompanying foot-note, Sir William Logan visited Lake Temiskaming in 1845. Among the rocks he described on the shores are what are now known as the Cobalt and the Temiskaming series, both of which outcrop at the water's edge, on the west side of the lake. In the report for 1848, the same author described the fragmental rocks on the north shore of Lake Huron, extending from the vicinity of Sault Ste. Marie to Killarney. In the report for 1863, the rocks of Lake Temiskaming, those of the north shore of Lake Huron and those at the mouth of the Doré River on Lake Superior and in other localities are classed as the Huronian series. While emphasis was laid on the fact that the members of this series all contain fragments of granite and gneiss, thus showing them to be younger than the series to which the name Laurentian was applied, it was also recognized that at certain localities there is granite and gneiss younger than the Huronian, as the following quotations from the report of 1863 show: "On the coast line between the Mississagui and Thessalon Rivers, a distance of about twenty-five miles, the gneiss extends from within about four miles of the former to within about the same distance of the latter; but it is very much disturbed by intrusive granite and greenstone, and, although there are great exposures of rock, it is very difficult to make out how the stratified portions are related to one another. The gneiss extends to the vicinity of a small stream about a mile and a half above Les Grandes Sables, and what is supposed to be the lowest Huronian mass of that part occurs about half a mile above the stream. It consists of a grey quartzite which abuts against one mass of gneiss and runs under another, and appears to be much broken by and entangled among the intrusive rock; but judging from a transverse measured in one part, its thickness would not be far from 500 feet. . . . .

" . . . The intrusive granite occupies a considerable area on the coast of Lake Huron, south of Lake Pakowagaming. It there breaks through and disturbs the gneiss of the Laurentian series, and forms a nucleus from which emanates a complexity of dykes, proceeding to considerable distances. As dykes of a similar character are met with intersecting the rocks of the Huronian series, the nucleus in question is supposed to be of Huronian age, as well as the greenstone dykes which are intersected by it."

From these quotations it would appear that there may be two series of fragmental rocks in Logan's Huronian group on Lake Huron, one intruded by what he calls Huronian granite and another not so intruded. These groups probably correspond to the younger Cobalt and the older Temiskaming series which are found at various points in the region to the northeast. In the younger series of Lake Huron there may also be an unconformity of lesser importance, comparable to that between the lower greywacké of the Cobalt series and the upper or Lorrain arkose. Fine-grained fragmental rocks, comparable in age to the Grenville series of southeastern Ontario, are known to occur at various points in the Cobalt-Lake Huron region. Unless great care is taken, these rocks, which are pre-Laurentian in age, are apt to be mistaken for the Huronian.

Descriptions of other authors tend to confirm the opinion that there are at least two groups of sediments on the shores of Lake Huron with a great unconformity between them. For instance, Alexander Winchell, from observations made in 1890 and 1891, concluded, from difference in metamorphism and great discordance in dip, that there are two series in the lake Huron area: "It is concluded that the name Huronian must be restricted to the upper or lower system; and if restricted to the upper system it remains attached to the best known and most characteristic portion of the old complex Huronian."*

* Quotation taken from Bull. 360, U.S.G.S., p. 412.

The quotations in preceding paragraphs show that Logan recognized granites and granite-gneisses of at least two ages in association with the rocks named by him Huronian. To the granites and gneisses older than the Huronian he gave the name Laurentian. Since Logan's time many outcrops of granite and gneiss, owing to the difficulty or impossibility of determining their ages, have been classed as Laurentian. Gradually, however, areas of granite, some of which are of large size, are being found to be intrusive into part of the fragmental rocks, named Huronian by Logan, and are being given distinctive names. Thus, in the vicinity of Lake Temiskaming, an area

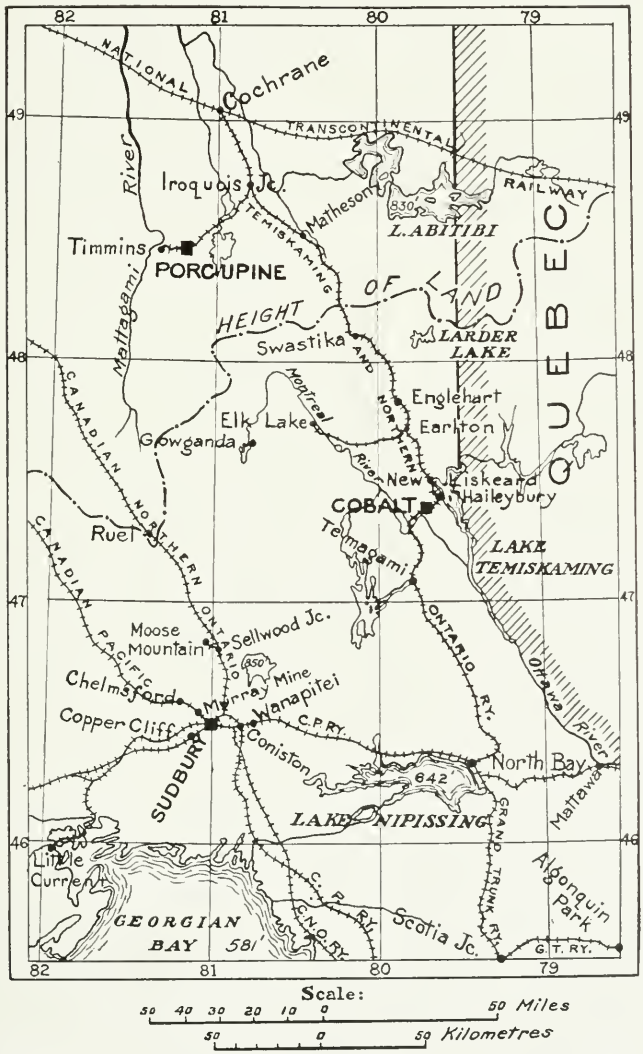


Fig. 21. Index map of the Cobalt-Porcupine-Sudbury region.

of granite 40 or 50 square miles or more in extent, formerly called Laurentian, has been found to intrude the Temiskaming fragmental series but not the Cobalt series. The granite has been given the name Lorrain, as shown in the following table. Areas of granite with the same relations to the Temiskaming and the Cobalt series have been described at Swastika, Porcupine and elsewhere. The Laurentian is thus being gradually reduced in volume, but the name is retained for those granites and gneisses that are older than the Temiskaming series, which frequently contains pebbles and boulders of these rocks.

The dual subdivision of the pre-Cambrian into Algonkian and Archean, or Proterozoic and Archeozoic, employed by many authors, is not adopted by the writer, since he believes that the Grenville series, which includes limestones and other sediments of great thickness, is of pre-Laurentian age. The thickness of the sediments in the Grenville and the character of the deposits make it inadvisable to attempt to subdivide the pre-Cambrian into an upper characteristically sedimentary group, above the Grenville, and a lower igneous complex including the Grenville sediments. The subdivision into Proterozoic and Archeozoic groups, the latter including the Grenville, is purely arbitrary. Thus a dual subdivision of pre-Cambrian rocks, based on arguments that have been employed in its behalf, fails. If a name is desired for the pre-Cambrian rocks, to correspond with Paleozoic and Mesozoic, the well-known name Eozoic may be used.

Age Relations of Rocks of Cobalt and Adjacent Areas

PALEOZOIC	
SILURIAN Niagara	Prominent outcrops of Niagara limestone, with basal conglomerate and sandstone, occur on some of the islands and the shores of the north end of lake Temiskaming.
(*Great unconformity*)	
EOZOIC OR PRE-CAMBRIAN	
LATER DIKES	Aplite, diabase, basalt.
NIPISSING DIABASE (*Intrusive contact*)	This diabase, which is of such great interest in connection with the cobalt-silver veins, is believed to be of Keweenawan age. Certain aplite dikes are genetically connected with the diabase.
COBALT SERIES (*Unconformity*)	The Cobalt series includes conglomerate, greywacké and other fragmental rocks.
LORRAIN GRANITE (*Intrusive contact*)	This granite occupies a considerable part of the township of Lorrain and has large exposures elsewhere in the vicinity of lake Temiskaming.
LAMPROPHYRE DIKES (*Intrusive contact*)	Lamprophyre dikes are to be seen near some of the mines at Cobalt.
TEMISKAMING SERIES (*Unconformity*)	Like the Cobalt series, the Temiskaming consists of conglomerate and other fragmental rocks.
KEEWATIN COMPLEX	The Laurentian, gneiss and granite, which in age lies between the Keewatin and Temiskaming, is absent in the Cobalt area proper, but is found in the surrounding region. Under the heading Keewatin are grouped the most ancient rocks of the region. They consist essentially of basic volcanic types, now represented by schists and greenstones, together with more acidic types, such as quartz-porphyry. With the Keewatin are included certain sediments, such as iron formation or jaspilyte, dark slates and greywackés, which probably represent the Grenville series of southeastern Ontario. Certain dike rocks that are grouped with the Keewatin may be of post-Temiskaming age, but since they have not been found in contact with the Temiskaming their age relationships are unknown.

Maps and Sections

The distribution of the rocks in the area immediately surrounding Cobalt, and in Gowganda and Elk Lake, is shown on the maps to which reference is made in the following paragraphs.

In preparing the original geological map of the Cobalt area on a scale of one mile to the inch, in 1904, I had the valuable assistance of Messrs. Cyril W. Knight and R. Anson-Cartwright. This map has gone through four editions. The last edition was partly revised by Mr. James Bartlett, a former member of the staff, and was enlarged so as to include the Gillies' timber limit, the South Lorrain area and the township of Casey, which lies to the north of the head of lake Temiskaming.

In 1906 Mr. Knight took charge of the work of preparing a detailed map of the more productive part of the area. This map is on a scale of 400 feet to the inch, with contour intervals of 10 feet over the more important part of the area. It was published at the end of 1907 and accompanies the third edition of the report.

The uncolored map of a part of the Cobalt area, scale 800 feet to 1 inch, has been revised and accompanies this report. It shows the distribution of the rocks, the position of the veins, and the location of the geological sections that are published with this edition of the report.

A colored geological map of the Gowganda area, scale 1 mile to 1 inch, prepared by Mr. A. G. Burrows, has been published since the third edition of the report was issued.

A geological map, scale 1 mile to 1 inch, of the Montreal river and Elk lake area, was distributed with the third edition of the report.

The colored cross sections that accompany this report went to press in Dec., 1911. Second editions of some of these sections have recently been prepared and are to be found on following pages. They are uncolored, and contain further information than was obtainable at the time the first editions were published. The plates illustrating the cross-sections are numbered I.-VI..

Fig. 22. Lang street, Cobalt, September, 1911.

THE KEEWATIN COMPLEX

The Keewatin rocks, of the Cobalt area proper, may be described under four groups: (1) Basalts, (2) Diabases and other basic rocks, (3) Acid intrusives, (4) Sediments.

The following descriptions of types of Keewatin rocks are by Mr. Cyril W. Knight.

(1) BASALTS

The basalts are the most common rocks found in the Keewatin complex. Typical outcrops occur at many points, a few of which may be mentioned.

Northwest of Contact bay, in Giroux lake, near the branch of the Temiskaming and Northern Ontario Railway, there is a fine outcrop. Fig. 23 gives a good idea of the ellipsoidal structure commonly found in these rocks. Similar rocks occur at the Shamrock, Temiskaming, Columbus and other mines. On the southern outskirts of the town of Haileybury, along the shores of lake Temiskaming, the steep banks have typical outcrops of the basalts, showing in certain areas ellipsoidal structures.

Although the basalts have been much decomposed and have been subjected to metamorphic agencies, they are, on the whole, massive rather than schistose. An amygdaloidal variety occurs at the head of Sasaginaga creek.

The rocks are fine in grain and have a prevailing green color, due chiefly to chlorite and other secondary minerals, such as serpentine and epidote. The groundmass commonly consists of plagioclase feldspar in lath-shaped crystals presenting the pilotaxitic texture, and showing more or less of flow structures. The original ferro-magnesian minerals in the groundmass appear to have been altered to secondary minerals, such as chlorite, and calcite. Glass has not been found in any of the thin sections examined. The original ferro-magnesian phenocrysts also seem to have been decomposed, but plagioclase phenocrysts occur, showing albite twinning lamellae. Porphyritic varieties may be seen on the O'Brien and Ferland-Chambers properties. Many thin sections have been examined of these basalts from surface outcrops and from underground workings. A description of some of these is given in the following paragraphs.

The greenstone immediately west of the Coniagas is typical of much of the Keewatin at Cobalt. It is a light greenish-colored rock, having tiny veinlets of chlorite, epidote, hornblende, calcite and iron sulphides ramifying through it. Under the microscope the rock is seen to be a decomposed basalt, consisting of a groundmass of plagioclase rods, in which are set phenocrysts of plagioclase and a colored constituent which is altered to chlorite. The groundmass contains, in addition to the feldspar rods, much secondary material, consisting of chlorite, epidote and hornblende.

A thin section from the Nipissing, between vein 49 and Cobalt lake, shows numerous plagioclase rods, together with chlorite, titanite, magnetite and much iron pyrites. The basalt in this area is stained with limonite, due to the decomposition of the sulphide.

Nine hundred feet east of the north end of Cobalt lake, at the main road, on the Ferland-Chambers, two veins are shown on the Cobalt map, scale 400 feet to an inch. An open cut affords good samples of the Keewatin here. The rock is porphyritic, the phenocrysts consisting of greyish green rods one-quarter inch long. Under the microscope these phenocrysts are seen to have been entirely decomposed and to consist now almost wholly of chlorite, together with smaller quantities of titanite, calcite and feldspar (sometimes twinned). The chlorite is the variety penninite, giving the deep indigo blue interference colors with crossed nicols. The phenocrysts are set in a groundmass which is made up dominantly of irregular plagioclase laths showing albite twinning lamellae, giving a maximum extinction angle of 20 degrees in the zone normal to the twinning plane. Subordinate quantities of calcite and titanite also occur in the groundmass.

The rock fifty feet south of the large bunkhouse on the O'Brien mine is somewhat similar to that just described. The thin section, however, shows that it is more decomposed, and consists of a fine-grained groundmass of chlorite (variety penninite), biotite, titanite, quartz and magnetite. In the fresher parts of the matrix, rods of plagioclase may be distinguished. Phenocrysts similar to those described in the preceding paragraph are set in the matrix.

A silica determination from the rocks described in the last two paragraphs gave 51.04 and 53.8 per cent. respectively. This silica content corresponds with that in the more acid basalts.

Fig. 23. Ellipsoidal basalt, north of Contact Bay, Giroux Lake, Cobalt.

A thin section from the Keewatin on the Watts (King Edward) shows it to be made up essentially of a network of feldspar rods, green allotriomorphic hornblende grains, and chlorite. Calcite, quartz, pyrite and titanite are present in smaller amount. In parts of the section plagioclase phenocrysts occur in the groundmass. Cutting across the slide there are microscopic veinlets containing hornblende.

The Keewatin on the west part of the Silver Bar property is fine-grained and in places schistose. Under the microscope it is seen to consist largely of rods of plagioclase, usually twinned once and much altered. In the more decomposed areas chlorite, hornblende, biotite, magnetite and other secondary minerals replace the feldspar rods. The section is ramified by tiny veinlets containing chlorite, quartz, hornblende, etc. The rock was found by analysis to contain 53.24 per cent. of silica, which is about the silica content of the more acid basalts or basic andesites.

West of Contact bay, Giroux lake, a thin section of the basalt consists of chlorite and laths of plagioclase feldspar. Epidote and zoisite occur, partly scattered through the groundmass and partly in tiny veinlets.

Basalts similar to those on the surface have also been found in the underground workings of many of the mines. On the 150-foot level of the McKinley-Darragh, 15 feet southeast of the great fault plane, the rock is a very fine-grained greenstone, consisting of plagioclase rods, hornblende, chlorite, and other minerals. On account of its proximity to the fault it has been crushed into fragments. In another part of the same level a thin section of the Keewatin shows a fine network of plagioclase laths, in the interstices of which are secondary minerals, such as chlorite and mica. Again on the third level the basalt is distinctly porphyritic, showing relatively large phenocrysts of plagioclase.

At La Rose mine, main shaft, on the second level, a specimen two feet north of the shaft shows one of the least altered basalts met with. It consists of the usual feltwork of plagioclase rods lying in saussurite, etc. Although the ferro-magnesian minerals appear to be altered to secondary material, the plagioclase laths are comparatively unaltered. Three thin sections were examined from the rock between the second and third levels and were found to be basalts or andesites, consisting of a fine-grained matrix of feldspar laths and secondary ferro-magnesian minerals. Occasional phenocrysts of plagioclase occur in this matrix. One of the specimens is much brecciated, probably owing to its proximity to the great fault. (See plate V.)

Basalt, felsite and chert occur on the 188-foot level, shaft No. 8, of the Lawson. The basalt is much decomposed, but a feltwork of fine plagioclase rods can still be seen in parts of the thin section. Much of the slide is made up of chlorite, calcite and saussurite.

A specimen from the Foster, at the 50-foot level of what in 1906 was known as the air-shaft, consists of chlorite, biotite, feldspar and magnetite, the feldspar occurring in rods.

Thin sections from the first and second levels of the Temiskaming mine show the rock to be made up of a feltwork of plagioclase rods which are set in a groundmass of epidote and other secondary material. A specimen from the winze on the fifth level, 540 feet below the surface, is found to be a fine-grained greenstone, apparently completely altered to secondary minerals—hornblende, saussurite, quartz, etc.

Diamond drill holes have been put down in the Keewatin at some of the properties. A thin section from a core on the Trethewey at a depth of 661 feet consists largely of secondary minerals of which calcite predominates. Epidote and sericite also occur. A few plagioclase rods may be recognized in this groundmass, disclosing its igneous origin. Another section from this core at a depth of 765 feet is similar to that at 661 feet. The hole was drilled at an angle of 62 degrees.

A drill hole was also put down on Dynamite island, Giroux lake. After passing through the Nipissing diabase the Keewatin greenstone was encountered; thin sections were examined from 375, 378 and 511 feet below the surface. These sections are made up of plagioclase rods, together with epidote, chlorite, etc., the last two mentioned minerals sometimes predominating.

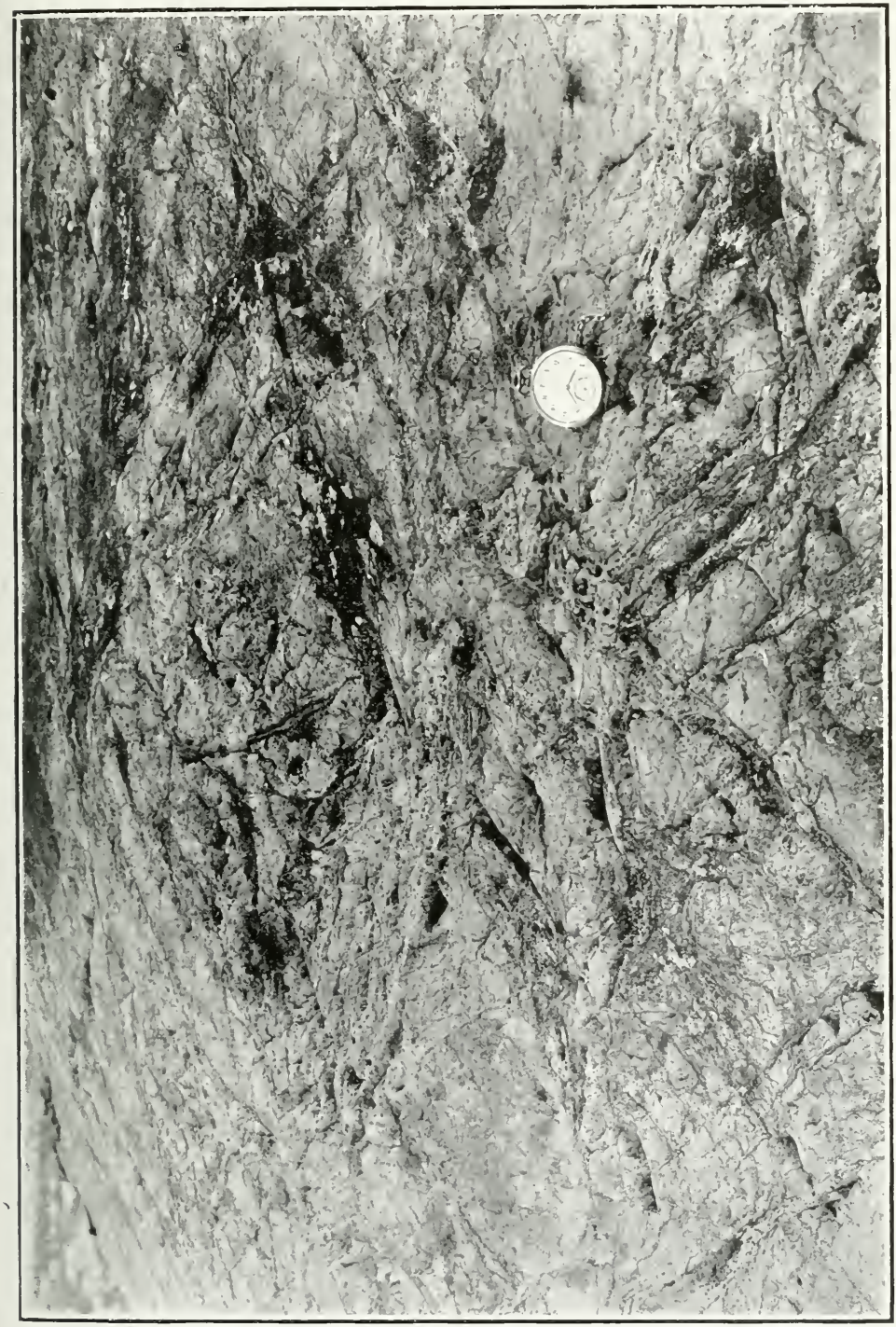


Fig. 24. Characteristic weathered surface of fine-grained Keewatin greenstone, McKinley-Darragh, Cobalt.

(2) DIABASES AND OTHER BASIC ROCKS

The diabases are of common occurrence in the Keewatin complex, although they are not as widely distributed as the basalts. They are fine to coarse grained, massive rocks, often showing a distinct ophitic texture in hand specimens. Ordinarily it is not difficult to distinguish this group from the Nipissing diabase, because the former has a characteristic "old" appearance which is soon recognized during work in the field. This "old" appearance is simply due to the decomposed state of the ferro-magnesian minerals and the plagioclase. As compared with the basalts, the Keewatin diabases are generally coarser in grain and fresher. A prominent intrusion occurs west of the Trethewey, Coniagas and Buffalo properties, while at the Temiskaming a well-defined dike is found a few hundred feet west of the shaft running in a northerly direction through the property. Other occurrences are mentioned below in connection with the microscopic descriptions.

Two thin sections were examined from the diabase immediately west of the Trethewey. They consist of plagioclase, hornblende, chlorite, epidote, zoisite, serpentine and leucoxene. The plagioclase occurs in rods and in many cases is altered to saussurite, but frequently albite twinning lamellae may be recognized, giving maximum extinction angles in sections normal to the lamellae of 20 degrees. The hornblende, which sometimes is in grains a quarter of an inch long, is the common green variety, occurring partly in more or less regular grains and partly in confused fibrous areas associated with chlorite and epidote. Parts of the sections show plagioclase rods embedded in the hornblende, giving a distinct ophitic texture to the rock. A section from the southwest corner of the Buffalo is also seen to be a much altered diabase. The freshest material present is hornblende, although much of this mineral is altered to chlorite. The feldspar is generally completely gone to secondary products, but some is fresh enough to show albite twinning lamellae. Distinct traces of an ophitic texture occur, showing rods of plagioclase largely altered to saussurite embedded in hornblende; the latter may have resulted from the alteration of pyroxene. A thin section from this diabase intrusion on the western edge of the Trethewey mine did not disclose an ophitic texture, and this part of the mass might be classed with the diorites, or gabbros.

A fine-grained diabase occurs on the 125-foot level of the No. 1 shaft of the Hargrave. On account of the proximity of the Nipissing diabase, a microscopic examination may not be definitely relied upon to correlate this rock with the older diabase; but if the fine-grained texture and decomposed condition be taken into consideration, it may tentatively be grouped with the older rocks.

On the third level of the Crown Reserve fine-grained diabase and other rocks occur. The diabase consists essentially of plagioclase feldspar and hornblende showing ophitic texture; both minerals are partly decomposed to the usual secondary products.

A section was examined from the 88-foot level of a shaft which was originally believed to be on the Silver Leaf, but which recent surveys have proved to be on the Lawson. The rock is a fine-grained diabase made up of plagioclase, hornblende, quartz, chlorite and saussurite. A poorly defined ophitic texture occurs.

On the 300-foot level of the Lumsden, 145 feet south of the shaft, the rock is a fine-grained, altered diabase, showing traces of an ophitic texture. It consists essentially of plagioclase and hornblende, together with the usual decomposition products. A specimen from another part of the same level is a very fine-grained greenstone, much decomposed, and consisting of plagioclase, hornblende, biotite and other minerals.

The basic dike previously mentioned as occurring on the Temiskaming a few hundred feet west of the main shaft shows in parts of its mass distinct ophitic texture, while in other parts it lacks this texture. For descriptive purposes, however, it is grouped with the diabases. The rock is well exposed on the surface, and has also been met with on a west drift from the second level. It varies in grain from fine to medium. Ten thin sections were examined, in six of which distinct ophitic textures were found. The dike consists now essentially of two minerals, hornblende and plagio-

clase, while quartz, leucoxene, chlorite, pyroxene, saussurite and other minerals are subordinate in amount. In a few cases it can be clearly seen that the hornblende is secondary after pyroxene. Quartz occurs sometimes in beautiful micrographic intergrowths with feldspar.

Thin sections from the Argentite (the southeast corner of the northeast quarter of the south half, lot eight, in the fifth concession of Coleman township), were examined by M. B. Baker in the laboratory of Prof. Rosenbusch, Heidelberg, Germany. Mr. Baker found the rock to consist of a fibrous, felt-like groundmass of talc, muscovite, saussurite and plagioclase. Scattered through this matrix are hypidiomorphic to idiomorphic crystals of diallage. Mr. Baker considered the rock to be a dolerite or diabase. A chemical analysis was made of the diallage by Mr. N. L. Turner, and it was found to have the following composition:

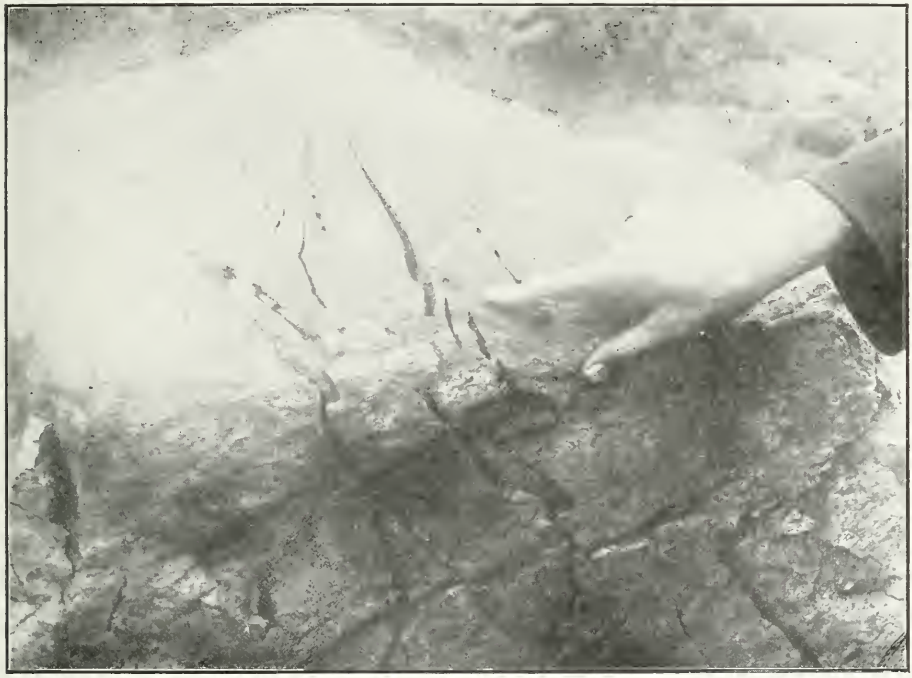


Fig. 25. Torsion cracks in Keewatin greenstone, lot 15 in the second concession of Bucke.

SiO_2	48.92
Al_2O_3, Fe_2O_3	18.88
CaO	12.16
MgO	18.00
Combined water	2.56

(3) ACID INTRUSIVES

The acid igneous rocks of the Keewatin, which are not widely distributed in the Cobalt area, include felsite, feldspar-porphyry and quartz-porphyry.

At the north end of Sasaginaga lake an occurrence of a white to light grey felsite presents a striking appearance on account of its light color. It is fine in grain and comparatively fresh, and consists of feldspar and quartz, the feldspar predominating. The rock has a micro-porphyritic texture, due to the presence of phenocrysts of feldspar and quartz. Often the feldspar rods in the matrix are arranged in parallel lines, which curve around the phenocrysts, producing what is known as a

flowage texture. Colored constituents appear to be absent. Some secondary calcite is present, with which also occurs some secondary quartz. Most of the feldspar shows albite twinning lamellae. One of the thin sections examined has a fragmental appearance, and there is developed in and around the feldspar grains sericitic material.

Felsites are also known in the underground workings of the Lawson and Crown Reserve. On the 188-foot level of the former the felsite consists of plagioclase and quartz, together with calcite, chlorite and other secondary material. On the 88-foot level of this mine similar rocks have also been met with. These felsites are probably of intermediate composition, judging from the presence of plagioclase and the subordinate part played by quartz.

On the third level of the Crown Reserve thin sections of part of the rock showed it to be a felsite, and to consist of short plagioclase rods, together with chlorite, biotite and quartz.

In the No. 5 shaft at the 130-foot level of the Drummond mine there occurs a fine-grained, fresh feldspar-porphyry. It is made up of phenocrysts of an acid plagio-

Fig. 26. Part of rock surface in Fig. 25 enlarged.

clase feldspar, set in a fine-grained matrix of feldspar, biotite and probably some quartz. At the 125 and 75-foot levels of the No. 1 shaft and on the third level of No. 3 shaft of the Hargrave similar feldspar-porphyries occur.

South of Haileybury, on lot 15, in the second concession of Bucke, there is exposed on the shore of lake Temiskaming a dike of quartz-porphyry which cuts the fine-grained greenstones. The dike is medium in grain and grey in color. The groundmass consists of tiny feldspar rods and quartz, together with chlorite, which, however, is subordinate. The phenocrysts consist of "eyes" of quartz and plagioclase feldspar, the latter showing crystal outlines. Apparently phenocrysts of a ferro-magnesian mineral were also once present, but they have been altered to chlorite.

The acid types occur in greater volume on the Quebec side of Lake Temiskaming, and are shown in the geological map prepared by Mr. Morley E. Wilson.*

*Map No. 1007, Geological Survey of Canada, Ottawa, 1907.

The igneous, Keewatin rocks, both basic and acid, frequently contain torsion cracks of striking appearance (Figs. 25, 26). These cracks, filled with white calcite or dolomite, serve to distinguish the Keewatin rocks from certain of those of the Cobalt series which overlie them. Otherwise, the Cobalt rocks that have been derived directly from the Keewatin, are indistinguishable from the latter except in thin sections under the microscope.

(4) SEDIMENTS

The sediments grouped with the Keewatin include iron formation (jaspilyte, chert and greywacké), graphite schists and slates.

The iron formation is exposed in several places between Kerr lake and the south end of Cross lake. Of this formation the red jaspilyte facies is of very subordinate distribution, but a few contorted bands several inches wide are exposed. In so far as our studies have gone, it would appear that the three members of the iron formation mentioned (jaspilyte, chert and greywacké) belong together in a conformable sequence. Under the microscope the cherts are seen to consist of quartz and feldspar grains, the former largely predominating. Chloritic and sericitic minerals also occur together with iron oxides. Microscopic veins of chlorite and quartz ramify through the rock. These dense, fine-grained, chert-like rocks pass into typical greywackés, composed of angular fragments of quartz and feldspar set in a matrix of chloritic and sericitic minerals. In one case there were, in addition to the minerals, fragments of felsites and basalts.

Graphite schists occur sparingly north of Clear lake and in the underground workings of La Rose and Columbus mines. A quantitative analysis of the schist from the Columbus showed 7.07 per cent. graphitic carbon and an absence of manganese. A thin section from the schist at the third level of La Rose, east of the great fault, shows the rock to be a greywacké, consisting essentially of angular fragments of quartz and feldspar. The graphite not only forms a matrix for these fragments but it also occupies the central part of many of the feldspar grains, in some cases, indeed, almost completely filling the interior, so that the feldspar itself forms merely an outer shell. The outline of several of the feldspar grains is interesting. While most of them are angular and irregular in shape, a few, however, have a short, stubby cylinder or cigar-like contour with pointed ends; others consist only of the pointed end of one of the cylinders. These peculiar grains also hold graphite under conditions similar to those found in the other fragments just described. It may be added that an organic origin of the pointed, cylindrical grains might be suspected by a casual examination.

At the head of Sasaginaga creek on the north side, near the old dam, a grey slate occurs, resting in a vertical position. Whether this belongs structurally with the Keewatin iron formation, or whether it is part of the Temiskaming series is not yet definitely known. In close association with it are found amygdaloidal lava and chert. The slate was found to have the following composition:

SiO	60.29
Fe_2O_3	1.64
FeO	5.77
Al_2O_3	21.10
CaO	.35
MgO	1.62
Na_2O	2.60
K_2O	3.19
H_2O	3.84
MnO	....
	100.40

Relationships

The various basalts, diabases, acid intrusives and sediments described above have not been seen directly in contact with the Temiskaming series or Laurentian granites proper, but for reasons given in another part of this Report they are classed with the Keewatin. The sediments, however, probably here represent the Grenville series of southeastern Ontario, which is to be described more fully in a forthcoming report by Mr. Cyril W. Knight and the present writer.* Regarding the relationships of the rocks to one another, it is known that some of the diabases are intrusive into the basalts and iron formation; the diabase dike at the Temiskaming, for instance, invades the fine-grained greenstones there, and the diabase intrusion west of the Trethewey invades an iron formation (chert). Regarding the fine-grained diabases at the Crown Reserve, Lawson and Lumsden, it may be that they are merely facies of the basalts. The quartz-porphyry dike, south of Haileybury (lot 15, in the second concession of Bucke) intrudes the fine-grained greenstones. The relationships of the intrusive diabases and acid rocks to each other are not known, since they have not been found in contact. The felsite on the north part of Sasaginaga lake is cut by a lamprophyre dike, while at Kirk lake these lamprophyres are cut by the Lorrain granite.

The Keewatin of the Gowganda and Elk Lake silver-cobalt areas is described on following pages. It is much like that of Cobalt, as is also that of the Porcupine gold area.

Ores of the Keewatin

Associated with the greenstones or schists of the much disturbed Keewatin are characteristic ores, in addition to those of cobalt and silver described on other pages.

These rocks are found in numerous localities in northern Ontario, between the western boundary of Quebec and the eastern boundary of Manitoba. In many places they are iron-bearing, the typical iron formation or jaspilyte being composed of interbanded magnetite or hematite with jasper or some other closely related silicious material.

These outcrops of the iron formation, or iron ranges as they are called, have attracted the attention of many writers. Some of the most important of them in northern Ontario are the following: those of lake Temagami; that in the township of Hutton; the Michipicoten iron range; and farther west the Mattawin and the Atikokan. In fact, all of the iron ranges of the northern part of the Province, with the exception of those in the Animikie or Upper Huronian series in the vicinity of Port Arthur and the titaniferous iron ores which are found in a number of places, belong to the Keewatin. There are two or three interesting occurrences in the area under review which show that this Keewatin iron formation has at one time been well developed here. Immediately south of Sharp Landing, near the shore of Temiskaming, there is an outcrop of the interbanded material, which is only about 25 feet in length. No other rocks of the Keewatin are here exposed, the Temiskaming series being distributed over the rest of the surface in the locality. The rocks of the latter series consist of conglomerate and greywacké. The pebbles in these show numerous representatives of the iron formation. Smaller outcrops of the iron formation are found near Cobalt.

A Buried Iron Range

It is thus seen that at Sharp Landing we have a portion of a buried iron range. The strike of the interbanded material in the exposure is somewhat north of west. In the outcrops of conglomerate, which are shown on the map, in the township of Hudson are found large blocks of this iron formation in the direction from the outcrop at Sharp Landing represented by the strike of the interbanded material at the Landing. We have thus good evidence that the iron range or formation lies at no great distance from the surface in this part of Hudson. Between these outcrops of conglomerate and Sharp Landing the range is cut through by diabase and it is over-

*22nd Report, Ontario Bureau of Mines, Part II.

lain by Niagara limestone and recent clay deposits, in addition to the Temiskaming and Cobalt series. This iron range no doubt extends farther west than Hudson. It has been covered up since Temiskaming times, as shown by the fact that it is overlain by rocks of this series, and has therefore not been subjected to glaciation, which is supposed to have produced injurious effects on the iron deposits of Ontario, it having been held by some writers, for instance, that the soft ores in these deposits have been gouged out and carried to the southward. Near the southeast corner of Cross lake in the township of Coleman there is a small exposure on the shore which also carries large angular blocks of the iron formation. We have found the iron formation in place, in the area which we have mapped as Keewatin, a short distance northeast of the Drummond mine. Much of the conglomerate in various parts of the area contains jasper pebbles and other material derived from the iron formation.

In addition to the iron ranges mentioned, there are outcrops of similar material in the township of Boston to the northward. Certain beds or series of beds in the Temiskaming series resemble the iron formation of the Keewatin.

Iron Pyrites

The iron pyrites deposits of this part of Ontario also belong to the Keewatin. One of these is shown on the map near the Montreal river, south of the township of Coleman. Others have been worked still farther to the southward between this point and lake Temagami.

Copper pyrites in the Keewatin has attracted attention at numerous places. Deposits of the mineral in the township of Lebel, along the upper parts of the Blanche river and in the vicinity of Temagami, have been worked.

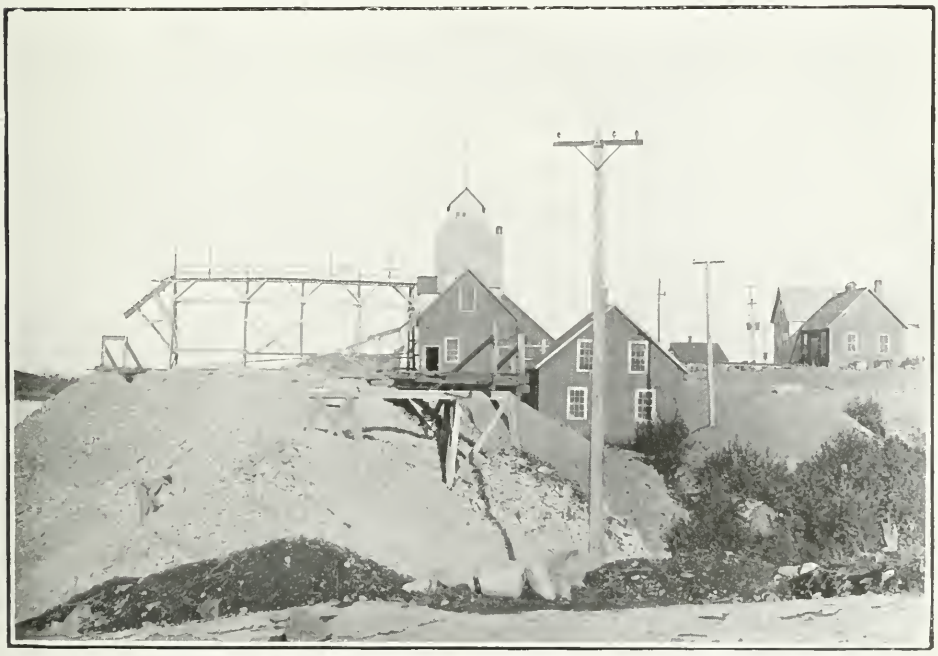


Fig. 26a. Kerr Lake mine, Cobalt.

THE KEEWATIN-LAURENTIAN COMPLEX

No granite, or granite-gneiss, older than the Lorrain granite, occurs in the immediate vicinity of Cobalt, nor has such a granite or gneiss been described in the vicinity of Gowganda, Elk Lake or other outlying silver areas of the Temiskaming district. While, however, outcrops of granite or gneiss to which the name Laurentian is strictly applicable are not found near the mines, certain pebbles and boulders in the conglomerates of the silver areas have been derived from the Laurentian. Brief mention may therefore be made of the character and relationships of these.

The Laurentian occupies large areas in the region in which the silver-cobalt mines are found. Rocks of this age, for example, outcrop almost continuously for fifty miles or more along the railway between North Bay and Doherty station. They consist characteristically of grey granite and gneiss, with alternate dark and light colored bands.

From a study of the relations of the Laurentian and Keewatin along the railway, to which reference has just been made, it appeared to Mr. Cyril W. Knight and the writer that the well-banded gneiss owes its composition and structure to the inclusions of fragments or masses of Keewatin in the intrusive granite, which have been squeezed or drawn out.* Near contacts large masses of Keewatin are enclosed in the granite. Farther away the inclusions are smaller and have been more readily squeezed, giving to the gneiss its characteristic banded or ribbon-like structure. Both the granite and gneiss are frequently cut by dikes of pink granite or pegmatite, many of which are narrow.

No rocks with the characteristics of the Laurentian are known that are older than the Grenville series, the Laurentian intruding both this series and the Keewatin. The Temiskaming is the oldest fragmental series known in the region that is of post-Laurentian age. While both the Temiskaming and Cobalt series contain pebbles and boulders derived from the Laurentian, the former series has not been seen in contact with the Laurentian unless it be on the southwest arm of Rabbit lake, east of Temagami station, where steeply dipping beds of conglomerate and associated rocks rest on the eroded surface of a grey granite-gneiss (Fig. 27). A short distance to the south of Doherty station, on the west side of the railway, rocks of the Cobalt series lie on the granite near its contact with the Keewatin.

*Twentieth Report, Ontario Bureau of Mines, pages 280-284.

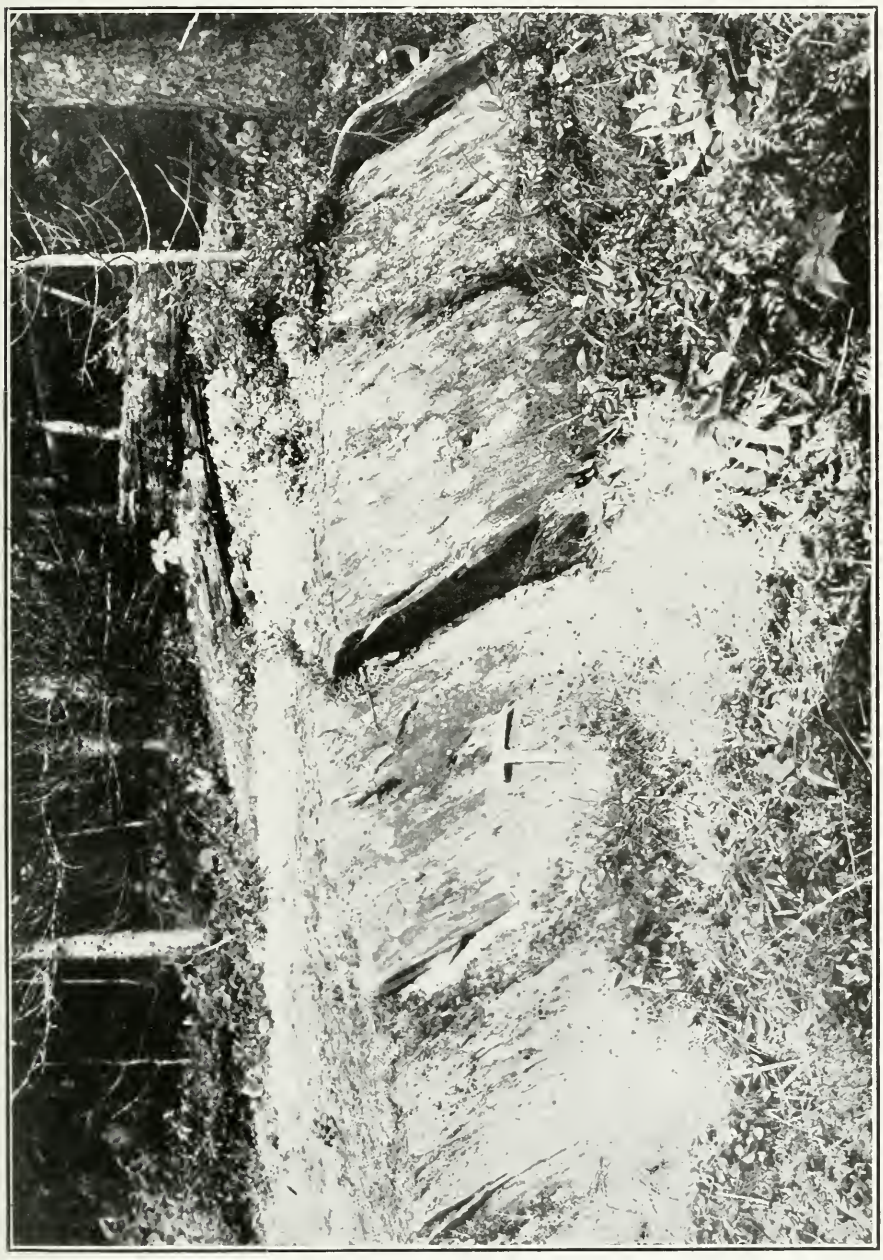


Fig. 27. Beds of conglomerate and other rocks dipping at a high angle, southwest arm of Rabbit Lake, east of Temagami.

THE TEMISKAMING SERIES

Distribution

The most important area of the Temiskaming series near Cobalt occurs a few miles to the southwest, west and northwest of Haileybury. Its distribution here is shown on the map (Fig. 28). In this area fine outcrops occur along the shore of lake Temiskaming, between Haileybury and New Liskeard. Small outcrops also occur at the southwest corner of Cross lake, and the northwest corner of Kirk lake. In all, the series occupies an area of three or four square miles adjacent to the productive silver area at Cobalt.

The series is prominent at Porcupine, where some of the gold deposits occur in it, and it is also found in the Gowganda area, on lake Abitibi, on the Quebec side of the interprovincial boundary and elsewhere throughout the region. From descriptions that have been published by various authors, it would appear that fragmental rocks of the Sudbury area, of the north shore of Lake Huron and at the mouth of Doré river, near Michipicoten Harbor, Lake Superior, are of the same age as the Temiskaming series. Fragmental rocks, called lower Huronian in Michigan, and intruded by granite, also appear to be comparable to this series. Probably also conglomerate and other fragmental rocks in southeastern Ontario, known as the Hastings series, should be correlated with the Temiskaming (*See* part 2, Vol. XXII, Ont. Bur. Mines).

By some writers it has been thought that the series on the Quebec side of lake Temiskaming, to which the name Fabre was given, is of the same character and age as the Temiskaming series. But an examination of the Fabre exposures last autumn by Mr. Cyril W. Knight and the writer led to the opinion that the series had been named under a misapprehension. Two localities, where the Fabre has been described as occurring and showing unconformable relations to the younger Cobalt series, were found to contain only rocks of the Cobalt series. The lower rocks, to which the name Fabre was applied, are the slate-like greywacké of the Cobalt series, such as occurs in the cliff at what is known as the Little Silver mine on the Nipissing property and in numerous other localities. Did an unconformity exist at the points referred to, viz., on the shore south of Fabre wharf and at the second dam on Young's creek, it would be comparable to the unconformity between the slate-like greywacké and arkose in the township of Lorrain described by the writer. The name Fabre, as applied to these rocks, should, therefore, be discarded.

Structure

The conglomerates, greywackés and slates, of which the Temiskaming series is composed, generally are distinctly bedded, and the strata are everywhere seen to have been tilted up until they now rest in a vertical, or almost vertical, attitude. Cross-bedding has been noted in some of the greywackés. Along the shores of lake Temiskaming the strike is easterly, observations giving strikes of N. 60° to 70° E., and steep dips to the south. At the northwest corner of lot 8, in the second concession of Bucke, the strike is N. 20° W., with steep dips to the east. In various places the series is intersected by quartz stringers a few inches in width and a foot or more in length. (Figs. 27, 29.)

Relationships

In the Cobalt area the sediments of the Temiskaming series have not been seen in contact with the Keewatin greenstones or Laurentian granites and gneisses. At the southwest end of Cross lake, however, the conglomerates are in contact with the Keewatin iron formation and they hold numerous fragments of chert and red jaspilyte belonging to that formation. In parts of the conglomerate here many of the red jaspilyte pebbles are very angular, giving the rock at times an autoclastic appearance. It is probable that a contact between the conglomerates and Keewatin greenstones may be found, when further stripping is done, between the Temiskaming mine and Kirk

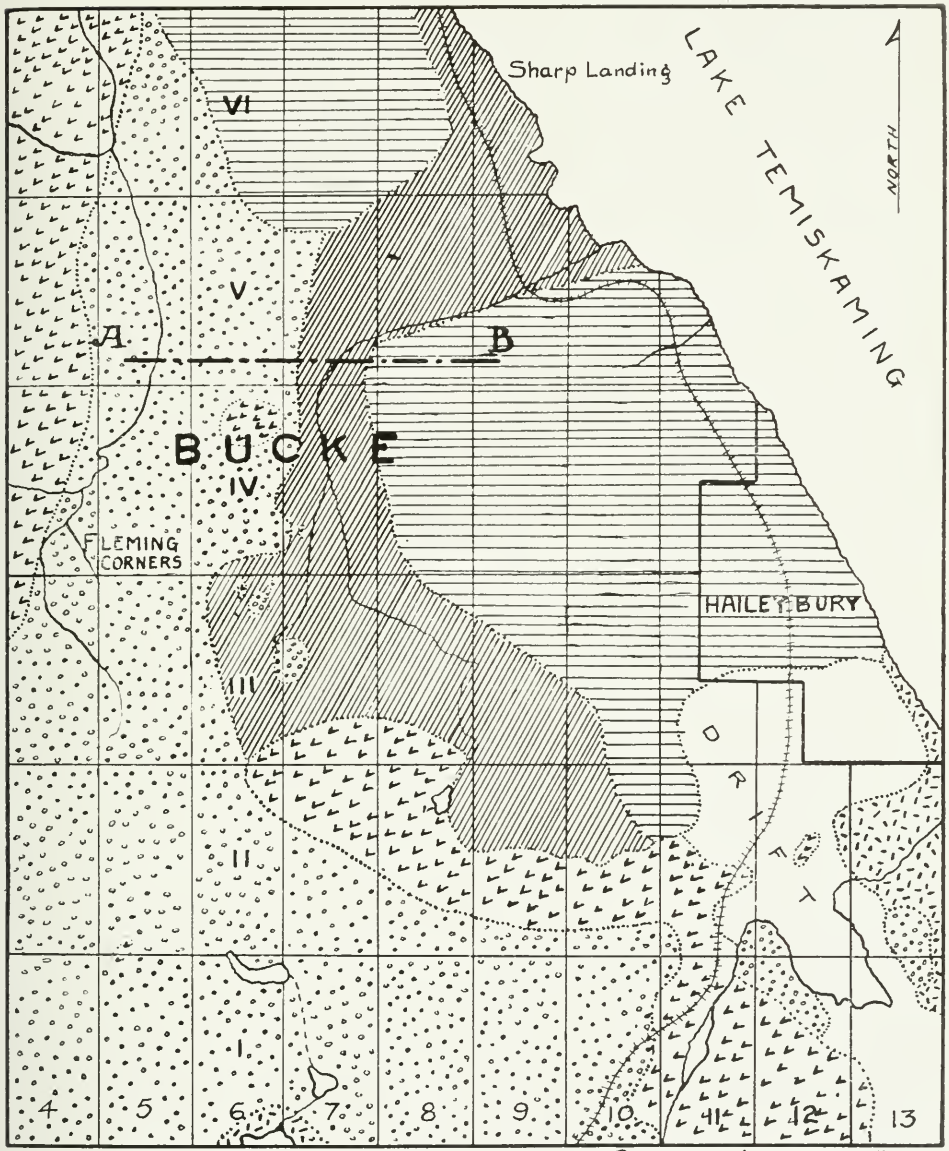


Fig. 28. Map showing distribution of Niagara limestone, Nipissing diabase, Cobalt, Temiskaming and Keewatin series. The centre of the map is about 3½ miles north

lake. Meantime, however, an unconformity is inferred to exist between these greenstones and the conglomerates, because the latter hold fragments of greenstone (basalt). The presence of diabase, acid porphyry and felsite pebbles in the conglomerate also clearly shows that the basement contains these rocks. For this reason the diabase dike at the Temiskaming mine, the diabase intrusive mass west of the Trethewey mine, the felsite on the northern shores of lake Sasaginaga, the acid porphyries at the Hargrave and Drummond mine, and the quartz-porphyry dike on the shores of lake Temiskaming below Haileybury, are all classed with the Keewatin series. It is to be noted, however, that these intrusives have not been found in contact with the Temiskaming conglomerate, and until they are their stratigraphic position will remain uncertain, especially since it is known that basic and acid intrusives invade the Lower Huronian sediments in the Vermilion Iron-Bearing district of the lake Superior region.

An unconformity is also inferred to exist between the Laurentian granites and gneisses and the Temiskaming sediments, because granite, syenite and granite gneiss pebbles are found in these sediments.

The Temiskaming series was invaded, first by lamporphyry dikes, and later by the great mass of Lorrain granite, which latter, near Kirk lake, has sometimes developed garnets in the adjacent rocks. Good contacts of the Lorrain granite and Temiskaming series are to be seen immediately south of the Temiskaming mine.

West of Haileybury about three miles an unconformity is exposed between the Temiskaming and Cobalt series. Here, at the southwest corner of lot 7, in the fourth concession of Bucke, the Cobalt conglomerate rests on the upturned edges of the Temiskaming greywacké, the latter showing distinct bedding. Nearby the older series is cut by lamprophyre dikes, which do not, however, invade the Cobalt sediments. In the same neighborhood there are several places where the two series are separated by a few feet of drift, but the discordance of the dips is so striking that there can be no doubt about the existence of the unconformity. At Fleming Corners the flat lying, slate-like greywackés of the Cobalt series are in marked contrast to the disturbed Temiskaming sediments one-half mile to the east.

Petrographic Characters

The Temiskaming series is composed of conglomerates, greywackés and slates. The conglomerates show a great variety of pebbles, including the following: basalt, diabase, green schist, pyroxene or hornblende-porphyry, quartz-porphyry, feldspar-porphyry, felsite, jaspilyte, grey, white and red cherts, grey granite, granite gneiss and coarse porphyritic syenite with crystals of feldspar one-half to one inch in length. Thin sections of fragments of the basalt pebbles from Cross and Kirk lakes show a feltwork of plagioclase rods, sometimes having flow textures; the plagioclase is set in a matrix of chloritic minerals, and one slide showed the plagioclase altered to chloritic material. The quartz and feldspar porphyry pebbles from Cross and Kirk lakes are made up of a fine-grained matrix of quartz and feldspar, with occasionally subordinate biotite; in this groundmass are set phenocrysts of feldspar, quartz and hornblende, the feldspar generally showing albite twinning lamellae. Two thin sections were examined of granite pebbles from the conglomerate between Haileybury and New Liskeard. They are made up of feldspar, quartz and hornblende; in one slide the feldspar occurs in phenocrysts, while in the other a porphyritic texture is lacking. A thin section from a granite gneiss pebble in the locality last mentioned shows the rock to be composed of quartz, feldspar and hornblende. These granite and granite gneiss pebbles are normal types.

The conglomerates have a white or grey color, due to the preponderance of light-colored pebbles, such as quartz and feldspar porphyry, felsites, etc. The size of the pebbles varies from tiny fragments to those which may be 15 inches or more in diameter.

Under the microscope the greywackés are seen to consist of angular fragments of quartz and feldspar set in a matrix of the same minerals in a state of fine division,

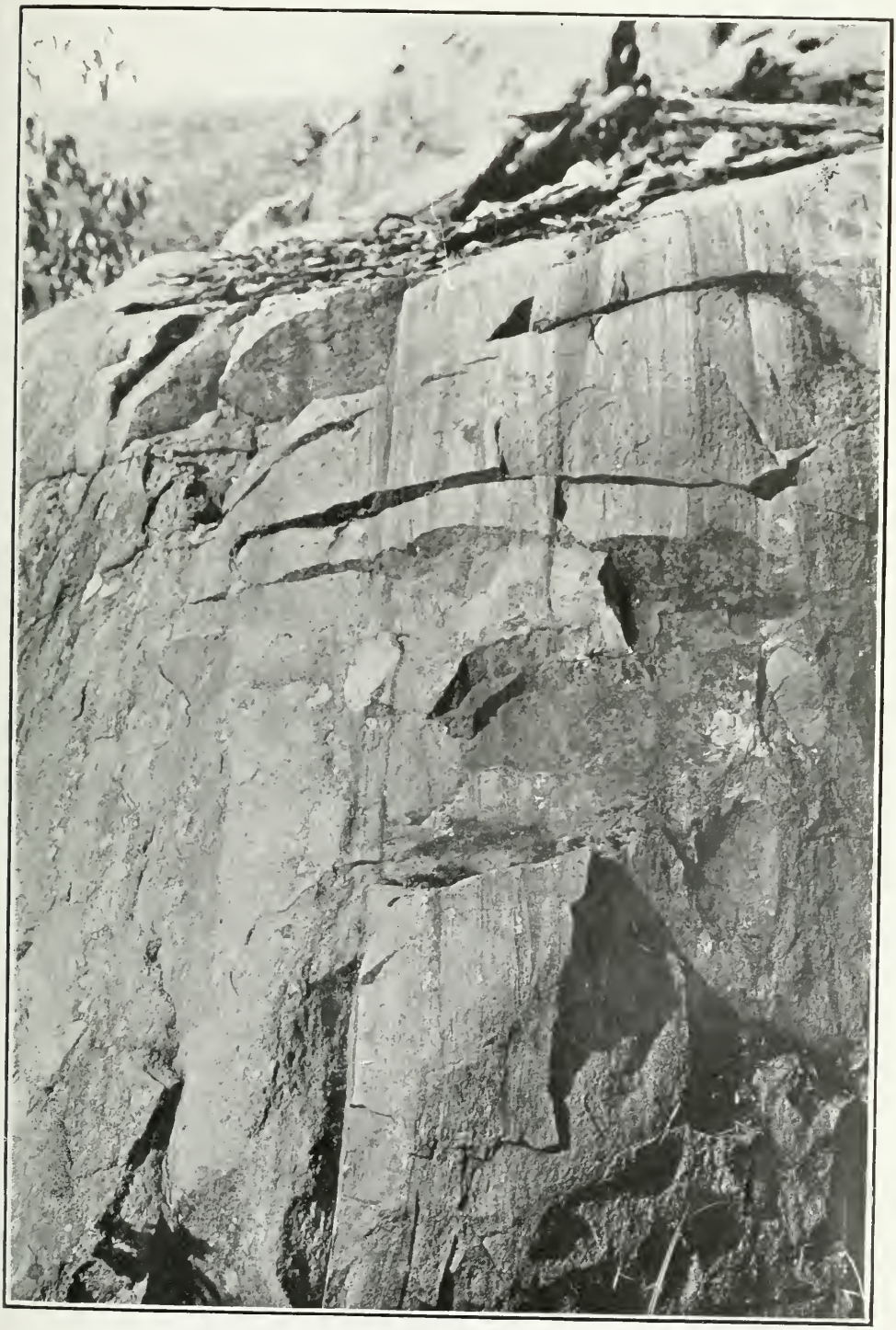


Fig. 29. Temiskaming series, with vertical dip, near shore of Lake Temiskaming, between Haileybury and New Liskeard. Cross-bedding is shown in upper part of picture.

together with epidote, chlorite, hornblende and mica. In thin sections it is difficult to distinguish some of the greywackés from similar rocks in the Cobalt series, but on account of the disturbed condition of the Temiskaming series, and the comparatively undisturbed condition of the Cobalt series, they may be differentiated in the field. On the north part of lot 10, in the second concession of Bucke, the greywackés pass into very fine grained rusty rocks, which look like certain facies of iron formation.

Thin sections of the grey slates at Sharp Landing, lake Temiskaming, show them to be very fine-grained dense rocks, made up of opaque or almost opaque minerals, difficult to identify on account of their minute size. Iron formation outcrops at the Landing and the Temiskaming conglomerate contains pebbles and boulders of it.

At one or two places in the Gowganda area, there appears to be evidence of the extrusion of lavas contemporaneously with the deposition of the normal Temiskaming sediments.

The thickness of the Temiskaming series is not known, but it is believed to be great.

Midlothian Township

The rocks of the Temiskaming series in Midlothian and other townships to the north of Gowganda, and fifty miles or more west of Cobalt, have been described by Mr. J. G. McMillan as follows:*

" . . . comprises a series of fragmental rocks, consisting of conglomerates, greywackés and a few quartzites, and composed chiefly of worn down Keewatin materials. The conglomerates are sometimes rusty from the presence of included pebbles of cherty iron formation. The largest area of these sediments occurs about Kiahkusagainda lake, on the southwest side of Mount Sinclair. Many observations of the attitude of these beds showed that they dip at high angles, usually between 60 and 70 degrees, to the northeast or east-northeast, so that the present attitude of these beds is, at high angles, nearly transverse to the folds of the Keewatin.

. . . . . .

"Relatively, the rocks of this series form a very small portion of the present surface. In addition to the principal area in Midlothian township, there are isolated remnants or islands in the northeastern part of Bartlett and in McArthur townships. Other small areas probably occur, but are apt to escape notice, and are not easy to distinguish from brecciated members of the Keewatin.

"Sedimentary beds of this series, dipping at angles of from 55 to 85 degrees, outcrop in the vincinity of Kiahkusagainda lake for a width of over two miles. This would indicate a thickness of at least 7,000 feet." (Fig. 30).

Temiskaming Series at Porcupine

Concerning the Temiskaming series in the vicinity of Porcupine, Mr. A. G. Burrows says:†

"At Porcupine the Temiskaming series is of great economic value, since several important [gold] veins have been found in it. The largest area of these fragmental rocks stretches from the Dome mine in a northeast direction for about ten miles. It consists of a series of slate, quartzite and conglomerate which has generally been greatly disturbed. The beds have been highly tilted, dipping at angles from 70 degrees to vertical. A secondary cleavage has been developed in many parts, and the rocks have been rendered quite schistose. The general direction of the strike is from N.E.-S.W. to E.-W. In this respect the series is related to the Keewatin, which has a corresponding strike. It is evident that much of the deformation of the Keewatin and Temiskaming was post-Temiskaming.

"The sediments at the Dome have been greatly altered to schists. Similar rocks around Three Nations lake have been less altered, and, except for a high dip, greatly resemble the Cobalt series.

*Report on the Geology along the T. & N. O. Railway trial line between Gowganda and Porcupine, with map, Toronto, 1912.

†21st Report, Ontario Bureau of Mines, Part I., pages 219 *et seq.*

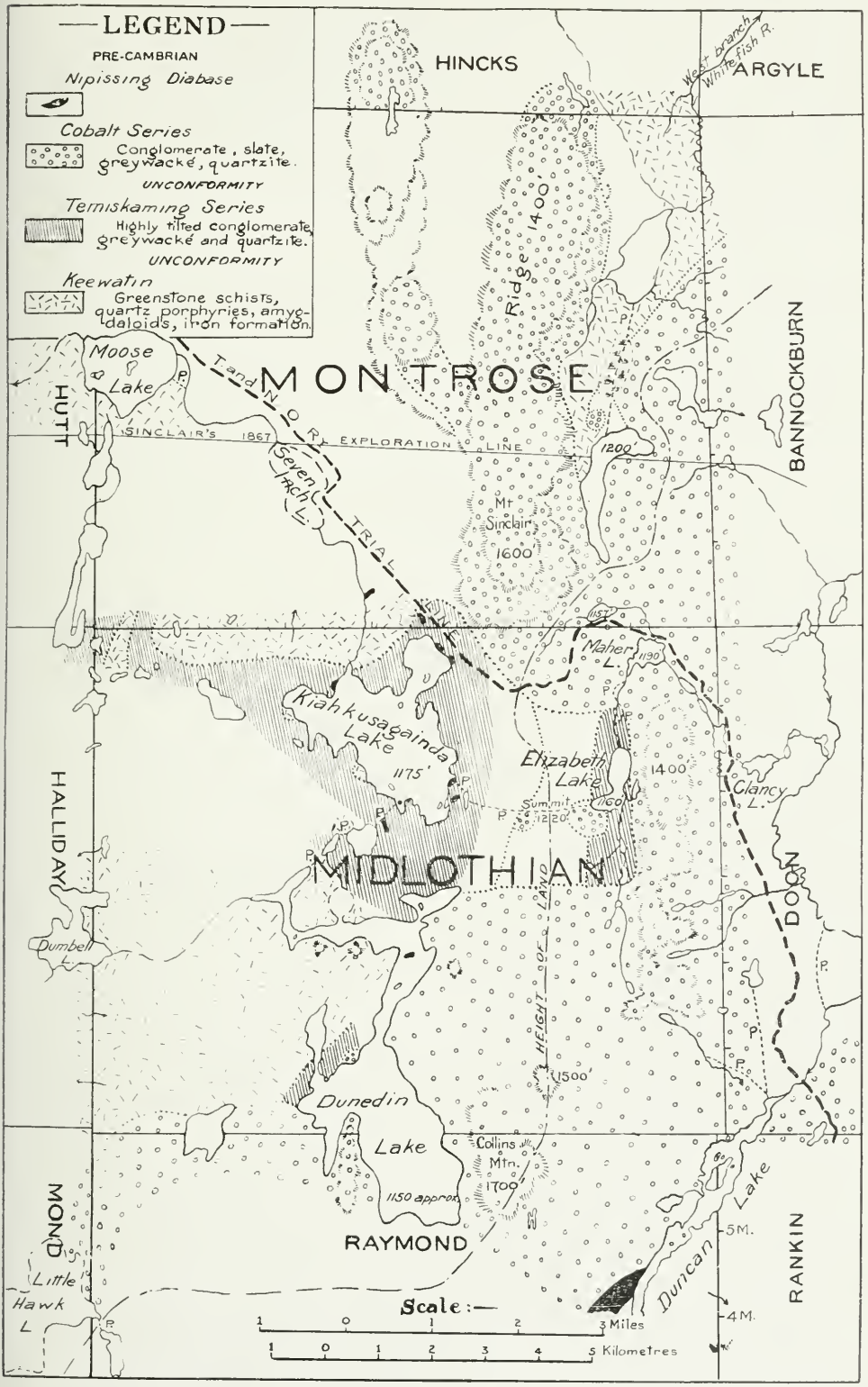


Fig. 30. Temiskaming and other series of rocks in Midlothian and adjoining townships.

"The succession of Temiskaming strata is well shown at the property of the Three Nations Mining Company on lot 5 in the fifth concession of Whitney. Along the line between the fifth and sixth concessions very much altered Keewatin rocks, now largely serpentine and rusty carbonate, are exposed. The contact with the Temiskaming conglomerate practically follows this line. At the base of the conglomerate are numerous fragments of rusty weathering Keewatin rocks; while farther to the south there are numerous pebbles of acid rocks, including the quartz-porphyry, felsite, etc. The conglomerate is succeeded by a narrow band of fine-grained black slate, which splits in very thin layers. Succeeding the slate is a greywacké which becomes coarser toward the south. About half a mile south of the concession line the rock is quite coarse-grained, and may be called an arkose-like quartzite. Throughout the Temiskaming series there is considerable carbonate, and many samples effervesce briskly with acid.

"It should be noted that no granite pebbles were found in the conglomerate. It is believed that the series was laid down when the surface rocks were largely volcanics, and that the intrusion of at least part of the granite came after the deposition of the Temiskaming, but prior to the Cobalt series.

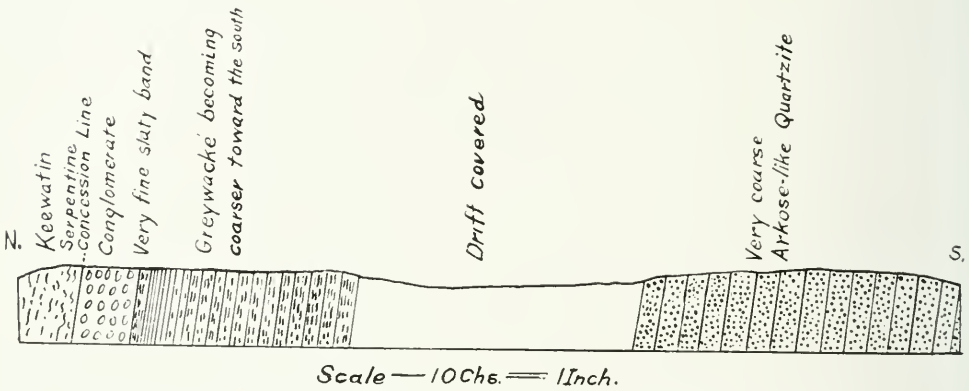


Fig. 31. Section of the Temiskaming series in lot 5, concession 5, township of Whitney, Porcupine. Fragments of the underlying Keewatin rocks are here found in the basal conglomerate of the Temiskaming series.

"At the North Dome there is a strikingly banded rock, which was originally formed by a succession of fine clay and rather coarse sand layers. A secondary cleavage is developed at a low angle with the upturned edges of the strata.

"On the Foley-O'Brian the sediments in addition to being highly tilted show a wavy structure along the strike.

"At the Dome property, in contact with large quartz masses, is a conglomerate which is likely basal. On the weathered surface the included fragments of porphyry, greenstone, schist, etc., are conspicuous, but in freshly broken pieces the conglomeratic character is easily overlooked, since the rock breaks in prismatic blocks resembling schist. The included pebbles are frequently drawn out in the direction of the schistosity. A thin section of greywacké from a mile west of the north end of Porcupine lake shows angular fragments of quartz and feldspar, together with sericite and other secondary minerals.

"Greywacké, with strike east and west and dip 85° north, occurs on the northeast shore of Night Hawk lake. In the greywacké are thin bands of conglomerate containing pebbles of dark green Keewatin rock, numerous quartz pebbles and some felsite. Some of the pebbles are six inches in diameter. A sample of the greywacké is seen under the microscope to consist of angular fragments of quartz and feldspar, with finer particles of the same material and chlorite, sericite and limonite.

"Altered sedimentary rocks outcrop at Wawaitin falls on the Mattagami river. These rocks have been greatly metamorphosed, but conglomerate, slate and quartzite

can be recognized. Some rusty bands of carbonate occur with the sediments. Similar rocks occur in Bristol township and at several points along the Mattagami river below Wawaitin falls. These rocks were formerly classed with the Keewatin, but from a similarity to the sedimentary rocks in Tisdale they are now grouped with the Temiskaming.

"On Red Sucker creek near Wawaitin falls at the third rock exposure from the Mattagami river there is a fresh looking greywacké which greatly resembles Huronian greywacké at Cobalt. The rock consists largely of quartz and feldspar, with some bits of rock like quartz-porphyry, in a cement of finer material consisting of quartz, feldspar, sericite, etc.

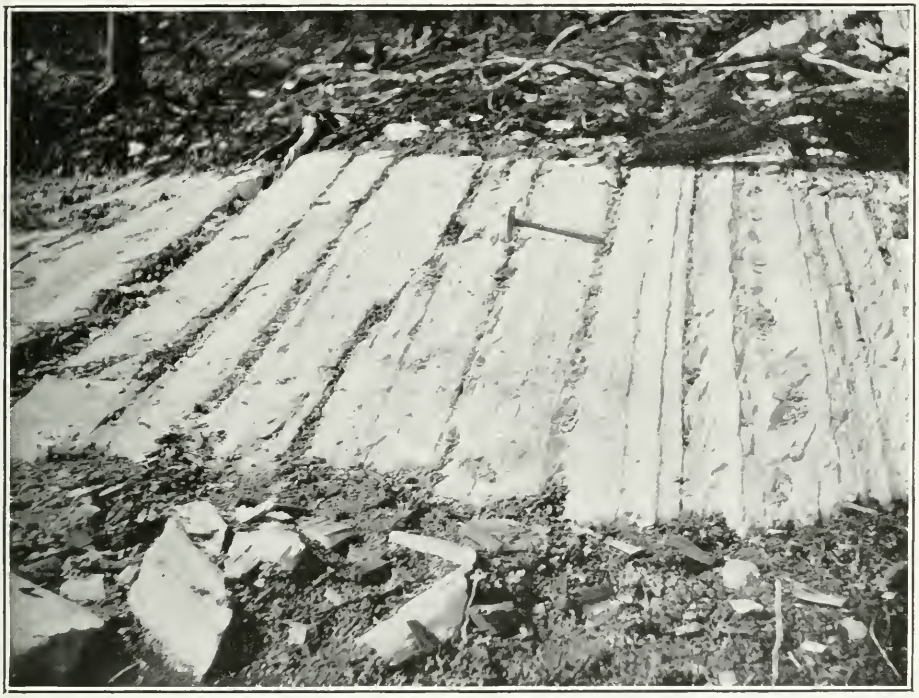


Fig. 32. Interbanded quartzite and slate of the Temiskaming series, showing secondary cleavage, North Dome mine, Porcupine.

Cobalt Series at Porcupine

"The younger series of sediments has been observed only in small volume on the south boundary of Langmuir. Here there is a typical undisturbed boulder conglomerate, very similar to the Cobalt conglomerate. It contains numerous pebbles and boulders of red hornblende and biotite granite, and rests unconformably on a Keewatin greenstone. Fragments of Keewatin occur at the base of the conglomerate."

ACID AND BASIC INTRUSIVES INTO THE TEMISKAMING SERIES

Under this heading are described the Lorrain granite and certain lamprophyre dikes, which have been found to penetrate the Temiskaming sediments. As has been said on a preceding page, other dikes that are provisionally classed with the Keewatin may intrude the Temiskaming series, but contacts have not been observed.

The Lorrain Granite

The distribution of the Lorrain granite is shown on the map of Cobalt, scale one mile to an inch. The rock is a coarse-grained, biotite granite, with a characteristic pink color. At Kirk lake it invades the Keewatin greenstone, the Keewatin iron formation (Grenville series), the Temiskaming sediments and the lamprophyre dikes. Whether some of the quartz and feldspar prophyries, described under the Keewatin series, are genetically connected with the Lorrain granite is not as yet known. The granite is overlain unconformably by the Cobalt series. Its relative age is therefore accurately known. Where it invades the adjacent formations it sends out in every direction many fine-to-medium-grained aplite dikes. In hand specimens these dikes are similar to some of the aplites which are the end phase of the Nipissing diabase. The latter dikes, however, contain only small quantities of potash, while the granite aplites at Kirk lake have normal percentages of soda and potash, as will be seen from the analyses given below. The intrusion of the Lorrain granite was probably the means whereby the Temiskaming sediments were tilted up into their present more or less vertical position. Near the contact the intrusion has sometimes developed garnets in the adjacent rocks.

Analysis No. 1, given below, is from the coarse-grained parts of the granite, while No. 2 is from the aplite dikes a few inches in diameter. In each case about a dozen specimens were taken in order to arrive at average results.

	1	2
SiO_2	71.86	76.03
FeO	2.34	1.29
Fe_2O_3	1.73	1.44
Al_2O_3	15.11	13.02
CaO	.51	.15
MgO	.43	.16
Na_2O	3.70	3.68
K_2O	3.48	3.74
H_2O	1.22	.96
	100.38	100.47

While the Lorrain granite has been intruded by the Nipissing diabase, silver-cobalt deposits of importance have not been found in it. That silver is readily deposited on the surfaces of or in cracks in the granite is shown by the occurrence of this metal in veinlets which penetrate granite boulders in the Cobalt series, in the vicinity of the veins at the Coniagas and Trethewey mines. Certain dikes from the granite penetrate the Keewatin in the lower workings of the Temiskaming mine and are cut through by the vein. The granite is here coated with silver.

Lamprophyre and Other Basic Dikes

Distribution

The dikes included under the general term lamprophyre are for the most part characterized by the prominence of hornblende, biotite or augite. They were first observed in the summer of 1906 on the west shore of Peterson lake. A hydraulic plant had been installed here for prospecting purposes by the Nipissing Mining Company,

and the soil on the hill facing the lake had been washed from the smooth glaciated rock surface, revealing several of these dikes. Since that year many others have been found, not only on the surface but also in the underground workings of several of the mines. Considerable trenching has been done at the southwest end of Cross lake and the northwest corner of Kirk lake, and many of the lamprophyre dikes have thus been uncovered in these areas. On the steep northwest face of the hill at the McKinley-Darragh a lamprophyre dike is well exposed. The Keewatin greenstones south of Haileybury, along the shore of lake Temiskaming, are likewise cut by these dikes, as are also the Temiskaming series of conglomerates and greywackés between Haileybury and New Liskeard. Again, about three miles west of Haileybury, near the main road, on lots 6 and 7 in the third and fourth concessions of the township of Bucke, there are many occurrences of the dikes, intruding the Temiskaming sediments. In the underground workings of the McKinley-Darragh, Little Nipissing, Kerr Lake and O'Brien mines the lamprophyres have also been met with. Other localities are known in the Cobalt area, and it is evident that these rocks are of common occurrence.

Certain lamprophyre dikes, *e.g.*, on the Nipissing property to the west of Peterson lake, contain rounded inclusions of the wall rock, and thus have the appearance of conglomerate.

Some of the mine operators at Cobalt are of the opinion that lamprophyre dikes, representing lines of weakness, in a few cases had an influence in promoting the fracturing of the rocks which gave rise to the fissures and cracks now occupied by cobalt-silver veins. It is interesting to note that veins are associated with similar dikes, kersantite, in the Saxon area, Annaberg, a description of which, with map, is given on a following page.

PETROGRAPHIC CHARACTER

It is possible that the lamprophyres include the following well-known types: minette, kersantite, vogesite and camptonite. It has, however, been considered sufficient to distinguish the rocks according to the prominence of the ferro-magnesian mineral present, so that the terms mica-, hornblende-, and augite-lamprophyre are here used. The dikes vary in width from about a foot to twenty feet or more. While they are

Fig. 33.—From photomicrograph of thin section of hornblende-lamprophyre dike cutting Keewatin, on west shore of Peterson lake, Nipissing mine.

somewhat disturbed, and in some cases much decomposed, they are, nevertheless, generally massive rather than schistose, and still preserve in many instances their original textures. The rocks vary in grain from fine to coarse, the phenocrysts of pyroxene sometimes having a length of one-quarter of an inch or more in the coarser varieties, though this is uncommon. The minerals occurrring are the following: hornblende,

biotite, augite, feldspar, quartz, apatite and the iron ores. Of these, hornblende is, perhaps, the most commonly occurring of the ferro-magnesian minerals, but biotite is generally present and sometimes predominates over the hornblende. The mica is a brown pleochroic variety, occurring in hexagonal flakes, and it is frequently bleached. Augite does not occur as abundantly as hornblende; it has altered to uralite in some cases. The feldspar, which is with or without albite twinning lamellae, has not been seen to occur in phenocrysts. Quartz is always subordinate, and occurs alone or in micrographic intergrowth with a feldspar. In some of the thin sections apatite was found to occur as an abundant accessory, in long rods large enough to be readily recognized.

Twenty-eight thin sections of the lamprophyres have been examined, and the hornblende variety was found to be most prevalent, with biotite more common than the augite type. Hornblende-lamprophyre occurs near the hydraulic plant on the west shore of Peterson lake; mica-lamprophyre occurs at Kirk lake, while a good example of the augite variety is found on the steep northwest face of the hill at the McKinley-Darragh mine.

RELATION TO ADJACENT FORMATIONS

The stratigraphic position of the lamprophyres is known with much exactness. They intrude the Keewatin and Temiskaming series, but are older than the Lorrain granite and the Cobalt series. The dikes may be seen cutting the Keewatin rocks at the McKinley-Darragh, at the Nipissing, on the shore of lake Temiskaming below Haileybury, and at other places. The Temiskaming series is cut by these dikes at Kirk lake, at the southwest end of Cross lake, along the shores of lake Temiskaming between Haileybury and New Liskeard, and in other areas. Between the northwest corner of Kirk lake and the Temiskaming mine apophyses of the Lorrain granite cut the lamprophyre dikes, proving the latter are older than the granite. Moreover, the lamprophyres have never been found invading the Cobalt series, but, on the contrary, large boulders resembling the lamprophyres occur in the conglomerate of this series. It is possible that certain basic intrusives which cut the Keewatin rocks are of about the same age as the lamprophyres, but until they are seen in contact with the Temiskaming series it is not possible to prove this assumption. For instance, the diabase west of the Trethewey and Coniagas mines, the dolerite at the Argentite property, and the diabase dike at the Temiskaming mine, may all belong stratigraphically with the lamprophyres. These rocks are described in other parts of the report. If this assumption is correct, it agrees with the relationship of certain diabases and basalts in the Vermilion iron-bearing district of the Lake Superior region. In this district diabases and basalts cut the Lower Huronian but not the Upper Huronian. It is also of interest to note that in the Lake Superior region lamprophyre dikes occur, intruding the Lower but not the Upper Huronian sediments. These dikes are described by Clements as composed of various combinations of plagioclase and orthoclase, with biotite, hornblende, augite, and iron oxide, hornblende and augite being the predominant dark silicates. Kersantites, vogesites and probably camptonites occur in that district.

THE COBALT SERIES

The age relations of this series of fragmental rocks are shown in the table on page 48.

Since eighty per cent. or more of the ore mined at Cobalt has come from veins, or parts of veins, that are found in this series, it is the most important, from an economic point of view, of the rock groups of the area. Hence the name given to it is appropriate. The series also presents many other interesting features.

Nomenclature in Former Editions of this Report

Since the members of the Cobalt series—greywacké, quartzite and conglomerate—in the productive part of the Cobalt area proper are the lowest of the fragmental rocks, resting as they do directly on the eroded surface of the Keewatin, and since their age relation to the rocks of the classic Huronian area of the north shore of lake Huron is not yet known, it was thought best to speak of them as the Lower Huronian of the Cobalt area. In the former editions of this report, and on the colored maps, they are thus, provisionally, called Lower Huronian or Huronian, the name Cobalt series being applied to them only in a general way. Boulders of certain fragmental material in the conglomerate at Cobalt, and others of like character in the conglomerate of Gowganda, described by Mr. W. H. Collins,* together with the description of a sedimentary series including conglomerate, invaded by granite, at lake Abitibi, by Mr. M. B. Baker,† and to the east of the Quebec boundary by Mr. Morley E. Wilson,‡ showed that in the region there is an older sedimentary series than that at Cobalt. Moreover, Drs. Barlow and Young, in their report and map on the Lake Temagami area in 1904, describe a quartzite series on Rabbit lake which they call Keewatin quartzite, and place lower in the geological column than the conglomerate and other fragmental rocks in which are found the cobalt-silver deposits. In view of these facts the term Lower Huronian, as stated in former editions of this report and in the notes accompanying the maps, was used only provisionally. It seemed best to avoid local names, which might be more confusing to those interested in mining rather than in the more scientific aspects of geology.

The development of Porcupine led to the mapping of that area in detail, and has shown that a series of fragmental rocks, older than that in which the cobalt-silver ores are found, occurs in much greater volume than does the series which is characteristic of Cobalt. The older series of fragmental rocks, occurring to the north of Gowganda, in Midlothian township, has been described and mapped by Mr. J. G. McMillan,§ and has been found to the south of this area by Mr. R. B. Stewart. As shown on a preceding page, the older series of rocks also occurs adjacent to the productive part of the Cobalt area (Figs. 22, 28, 30).

It seemed necessary, therefore, in this edition of the report, to adopt local names for the two well developed series of pre-Cambrian sedimentary rocks of the region. Since the relations of neither the one nor the other to the rocks of the classic Huronian area are definitely known, it was decided for the present, at least, not to make use of the name Huronian. To the younger series that lie on the eroded surface of the Lorrain granite and other rocks, and contain many veins of rich cobalt-silver ores, the name Cobalt is applied in this report. To the older series of fragmental rocks that are intruded by the Lorrain granite and are not of importance in the productive part of the cobalt-silver area, the name Temiskaming is given. This latter series is described in preceding pages.

*Gowganda Min. Div. Report No. 1075, Geo. Sur., Can.
†18th Report, Ont. Bur. Mines, p. 275 *et seq.*
‡Geo. Sur. Can. No. 1064, pp. 18, 20.
§Report on Railway Trial Line between Gowganda and Porcupine, with Geological map. T. N. O. Railway Commission, Toronto, 1912.

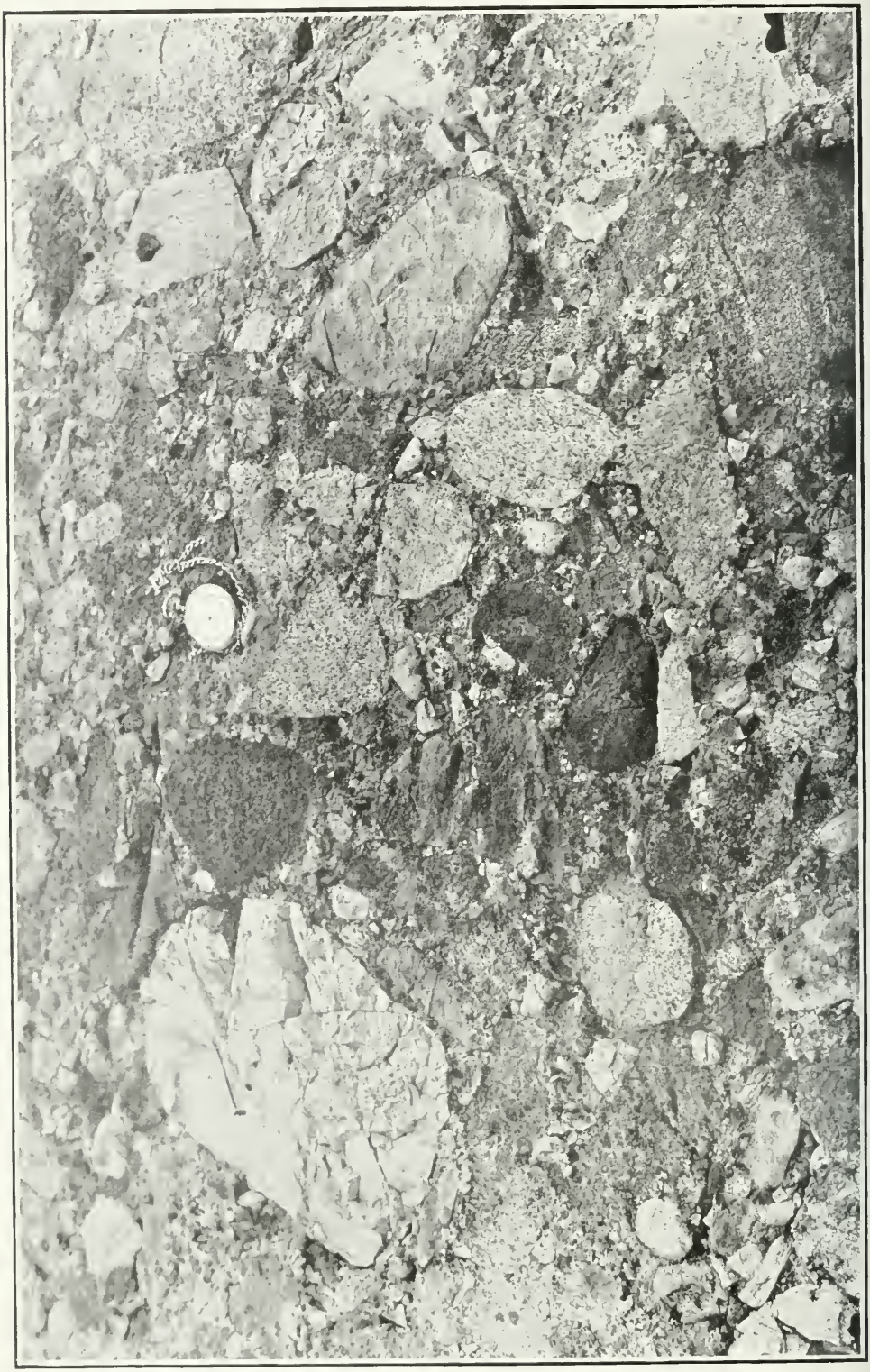


Fig. 34. Coarse boulder conglomerate of the Cobalt series, Cobalt.

Inclusion of Lorrain Arkose and Quartzite with Cobalt Series

The arkose and quartzite, to which the name Lorrain is applied in preceding editions of the report and on the colored maps, occurs in certain localities somewhat distinct from the conglomerate and other fragmental rocks of the productive part of the Cobalt area. For this reason and owing to the discovery of an unconformity between the arkose and the greywacké, such as that in which the veins are found at Cobalt, the Lorrain arkose and quartzite were named, provisionally, in former editions of the report, Middle Huronian. The unconformity referred to, as shown in following paragraphs, is not always present between the greywacké, or the rocks which are associated with it at Cobalt, and the arkose in the surrounding areas. In fact, there appears, judging from the observations of several workers in the region, to be in many cases a conformable sequence from the Cobalt conglomerate and greywacké upward through the Lorrain arkose and quartzite. It has thus been decided to group the Lorrain arkose and quartzite with the greywacké and conglomerate of the productive cobalt-silver area and to apply the name Cobalt series to all of these rocks; and to consider the unconformity, which has been observed at only two or three places, as not representing a great period of erosion.

The Lorrain arkose and quartzite, in so far as the cobalt-silver ores are concerned, have not been found to be of economic importance. Owing to this and to the fact that the arkose and quartzite frequently occupy tracts of country in which the lower members of the Cobalt series are practically absent, it is well, as far as possible, to distinguish on the maps, as has been done, the lower members from the upper (*See* colored maps of Cobalt, South Lorrain, Elk Lake and Gowganda, all on scale of 1 mile to 1 inch).

Erosion and Faulting

Erosion has left but remnants of the Cobalt series, which in a past age covered practically all the surface in a vast region in Ontario.

Faulting has played a part in the destruction. Elsewhere in this report great faults are mentioned which have profoundly affected Cobalt and the surrounding areas. Since, on the whole, the surface of the country, in the vicinity of Cobalt, does not now show great inequalities, it is seen that the rocks on the upthrow sides of the faults have been worn down until the surface stands at the level of the downthrow sides of the faults, the latter side also having been deeply eroded. The rocks of the Cobalt series have in many cases been worn completely off, exposing the Keewatin and other members of the older series.

While faulting has thus played its part in the destruction of the Cobalt series, and of course of older rocks as well, it has also, in some cases, had a protective effect. In certain areas, *e.g.*, along the west side of the fault in Cobalt lake, the Cobalt series on the downthrow side of the fault has a much greater thickness than it has on the east or upthrow side. In this lake the rocks on the downthrow side have not only been protected and preserved to a greater extent than have those on the opposite side of the line of fault, but the rich veins of cobalt-silver ore in them have also been thus conserved and have added to the length of the lives of the mines.

In other areas in the surrounding region certain of the highest hills are composed of rocks of the Cobalt series and appear, judging from their almost vertical faces and other features, to represent the upthrow sides of faults. Such hills are represented by Mt. Chemaniss, near the Quebec boundary, over forty miles north of Cobalt, and Mt. Sinclair, which lies about seventy-five miles to the northwest of Cobalt. Exposed in a face of the former hill are 550 feet of sediments of the Cobalt series, while in the latter there are about 300 feet. Both hills are referred to on following pages.

While faults are known that antedate the deposition of the Cobalt series, there are others which are much more recent. There are even small faults of post-Glacial age. The Silurian limestone in the township of Bucke, to the northwest of the town of New Liskeard, presents a striking cliff face, which was evidently produced by a

fault of considerable magnitude. This fault is of post-Niagara age, but just how recent it is cannot be determined. It is on a line that is a continuation of the remarkably straight western shore of lake Temiskaming.

The Cobalt series has thus been affected by faults at various periods. Were the region not covered to such an extent with glacial and recent deposits, without doubt a remarkable series of faults could be worked out.

Composition of the Cobalt Series

The series is wholly of fragmental origin, and contains rocks varying from those that are uniformly fine in grain to those that contain boulders several feet in diameter. The kinds of fragments composing these rocks are almost innumerable, representing as they do the erosive products from all the older pre-Cambrian series of the region—Keewatin, Laurentian, Temiskaming, Lorrain granite and intrusives of various ages. Naturally, fragments of the harder rocks and minerals have withstood better the destructive agencies to which they have been subjected, and the Cobalt series, especially the members of it that are coarser in grain, contains grains of feldspar and quartz, and pebbles and boulders of granite and other igneous representatives, in greater numbers than it does of minerals or rocks that weather or are abraded more readily. But representatives, as has already been said, of all the older rocks in the region are to be found in the form of pebbles or boulders as components of the Cobalt series.

Boulders Composed of Conglomerate

From the description of the Temiskaming series, on a preceding page, it will be seen that it, like the Cobalt series, consists of fragmental rocks, ranging from greywackés fine in grain to coarse conglomerates. Probably the most remarkable boulders in the conglomerate of the Cobalt series are those of conglomerate from the Temiskaming series (Fig. 35). If the latter series has furnished conglomerate boulders to the former, undoubtedly it has supplied pebbles or boulders of quartz and other minerals and rocks which once were constituents of its conglomerates, thus recalling the lines:

"The dust we tread upon was once alive."

Order of Deposition

The surface of the region, in the period immediately preceding the deposition of the Cobalt series, was uneven, and possessed in all probability higher hills and deeper valleys than those of the present surface. Having been laid down on such an uneven floor, the series cannot be expected to show the same thickness of sediments everywhere, even had a great period of erosion not elapsed between the deposition of the sediments and the present time. Moreover, it would be expected that there would be a considerable variation in the order of succession of the sediments from those that lie at the base to those that form the upper members. While such variation in the thickness of the members of the series, and in their order of deposition, has been observed, as is shown in the following table, still, while the thickness of the members differs from place to place, there is a pronounced definite order of deposition in the areas which have been studied by various workers throughout a wide region. The following quotations show that the order of succession of the members of the series in the surrounding areas is similar to that at Cobalt itself (Fig. 22, map).

Speaking of the Cobalt series at Larder lake, which lies about fifty miles north of Cobalt, Mr. Morley E. Wilson says: "An approximately regular succession can be recognized in the Huronian of this district. At the base is a conglomerate, which passes gradually upward through greywacké into arkose, which in its turn grades into an upper conglomerate."*

Of the series in the Montreal River area, forty miles northwest of Cobalt, Mr. W. H. Collins says: "The basal member is a conglomerate sometimes possessing a breccia

*Summary Report, Geo. Sur. Can. 1909, p. 176.

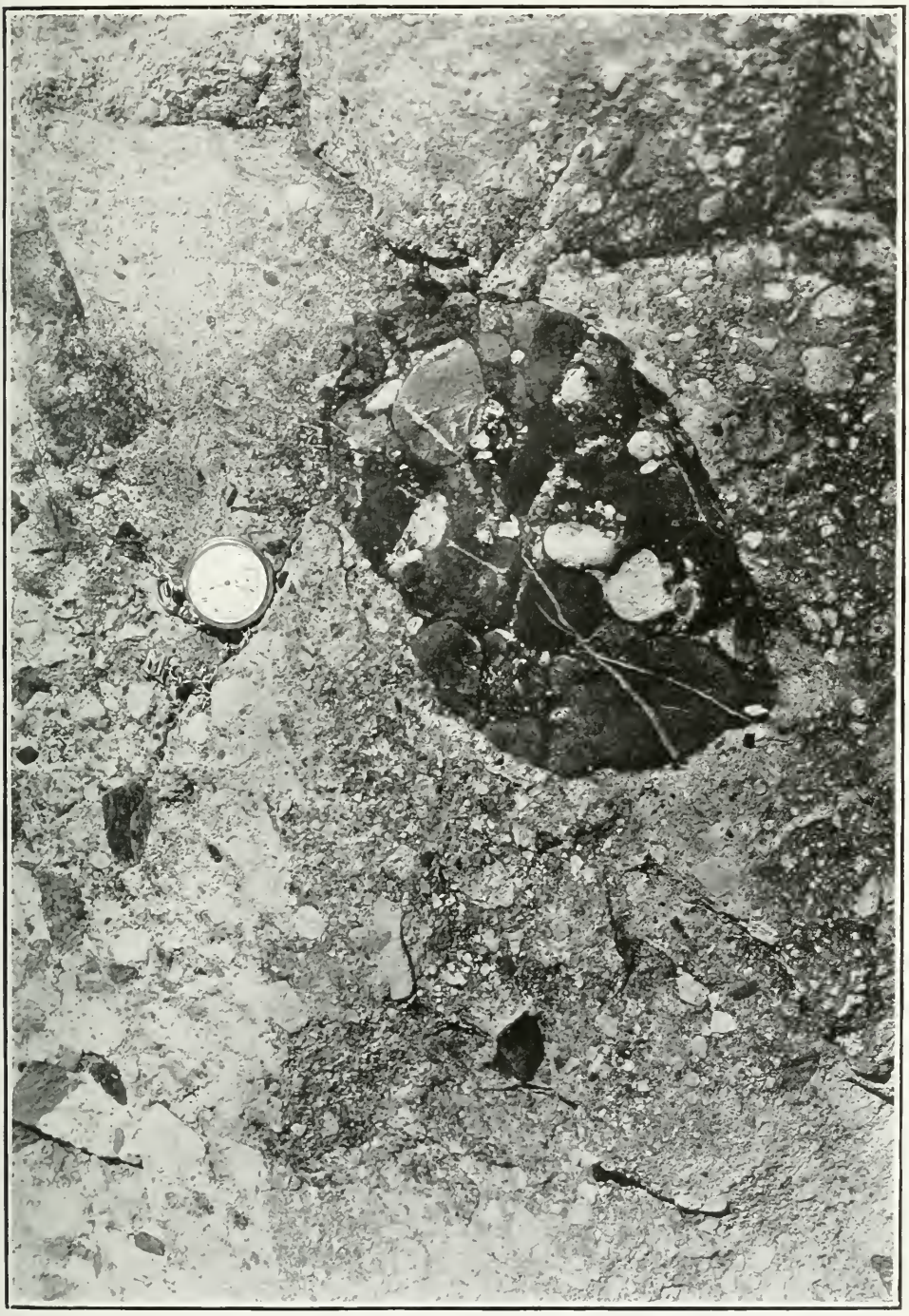


Fig. 35.—Boulder of conglomerate of the Temiskaming series enclosed in conglomerate of Cobalt series, at roadside, southwest corner lot 7, in the fourth concession of the township of Bucke.

structure and remarkable for the irregular distribution and frequently enormous size of its included boulders. This grades upward through greywacké into finely laminated slate and quartzite, followed in turn by an upper conglomerate."*

In Gowganda, fifty miles or more west of Cobalt, according to Mr. Collins, the same succession is observed: " . . . rocks are of clastic nature, consisting in ascending order of conglomerate, greywacké, slate and quartzite, which pass conformably into an upper conglomerate, while a granite-like, arkose member is believed, from its similarity to rocks of the same character in the Cobalt area, to be possibly of later age."**

Thickness

Having been subjected to erosion during most of the vast period that has elapsed since pre-Cambrian time, the uppermost members of the series have been removed, thus making an exact determination of the original thickness of the series impossible.

Moreover, complete sections of the thicker exposures of these rocks that occur in the region, such as those of Mount Sinclair and other hills in that vicinity, and Mount Chemaniss and other hills in the Larder lake area, are not obtainable, the basal member, conglomerate, of the series either being not exposed or not completely so.

In the Cobalt area the writer estimated that the series at some points may now have a thickness of at least 500 feet.

Mt. Sinclair, in the township of Midlothian, north of Gowganda, according to Mr. J. G. McMillan, has a thickness of these rocks of 300 feet, passing from the conglomerate, the lower part of which is concealed, upward through greywacké, slate, and quartzite to conglomerate at the top.†

Mt. Chemaniss is described by Messrs. Parks and Bowen as having a thickness of 550 feet, the greywacké at the bottom passing upward through quartzite to conglomerate at the top.‡ Here the base of the section is concealed.

In all of the sections just mentioned, the Lorrain arkose and quartzite are absent.

The following table shows the thickness of the Cobalt series at several characteristic localities, and the nature of the sediments together with the order of deposition.

WENDIGO LAKE	LITTLE SILVER CLIFF (Cobalt)	MT. CHEMANISS	MT. SINCLAIR	MAPLE MOUNTAIN
Conglomerate *	Conglomerate (30 to 40 ft.)	Conglomerate (100 ft.)	Conglomerate *	Arkose and Quartzite (900 ft.) ***
Greywacke and Quartzite (26 ft.)				* * *
Quartzite (10 ft.)	Quartzite (15 ft.)	Quartzite (135 ft.)		* * *
Greywacke (54 ft.)	Greywacke (20 ft.)	Greywacke (315 ft.)	Greywacke (300 ft.)**	* * *
* * *	* * *	* * *	Conglomerate *	* * *
Total thickness 90 ft.	70 ft.	550 ft.	300 ft.	900 ft.

*Thickness not given. **Greywacke contains occasional beds of slate and quartzite. ***Base of section is not exposed.

The arkose and quartzite of Maple mountain, described on another page, are considered to represent the Lorrain or upper part of the Cobalt series. This mountain contains the greatest thickness of sediments known in the region.

As an example of a section where members of the series are absent may be cited the exposure on the shore of the bay, on the east side of lake Temiskaming, immediately south of Fabre wharf. Here the upper conglomerate lies on the surface of the well-banded greywacké. In the township of Lorrain, an outcrop, described in accompanying pages, consists of Lorrain arkose resting unconformably on the slate-like greywacké, the quartzite and upper conglomerate being absent.

*Idem, 1908, p. 117.
**Preliminary Report on Gowganda Mining Division, Geol. Sur. Can. 1909, No. 1075.
†Report on the Geology along T. N. O. Railway trial line between Gowganda and Porcupine. Toronto, 1912.
‡Summary Report, Geol. Sur. Can., 1904, p. 220. 17th Report, Ontario Bureau of Mines, p. 11.

Underlying Surface

In the vicinity of Cobalt, in so far as observation has gone, the Cobalt series always rests on a weathered surface of one or other of the older series of rocks. Most commonly the underlying series is the Keewatin, as rocks of this age are more widespread in the productive part of the area than are the other pre-Cobalt series. No surface that has the appearance of having been produced by glaciation or rendered smooth by other means is known beneath the Cobalt series in the vicinity of Cobalt.

Where the rocks of the Cobalt series rest on the greenstones or other easily decomposed members of the Keewatin there is a gradual transition from the non-

Fig. 36.—Contact on the shore of Lake Temiskaming between the Keewatin and Cobalt series. The breccia of the Cobalt series rests on the Keewatin rock, from which it was derived. The light-colored fragments of the breccia are set in a dark ground mass. Lot 15 in the second concession of Bucke.

disintegrated rock upward into the distinctly fragmental member of the Cobalt series. The disintegrated material on the surface of the Keewatin has been recemented and consolidated, or, in other words, recomposed. It is impossible at certain contacts, without the examination of thin sections under the microscope, to distinguish the recomposed material from the underlying massive igneous rock.

Something the same may be said of the contact between the upper members of the Cobalt series, the Lorrain arkose, and the Lorrain granite. In the township from which the name of these rocks is derived, arkose lies on the weathered surface of the granite, there being a gradual passage from the undecomposed rock upward into the arkose.

At the base of the Cobalt series there is the recomposed material described in the preceding paragraphs with, typically, conglomerate or breccia, the most of the fragments of which can be seen to have originated in place. A striking example of the origination *in situ* of such material is to be seen on the shore of lake Temiskaming, on the extreme north end of lot 15 in the first concession of the township of Bucke, a couple of miles south of Haileybury. Here, as the geological map, scale 1 mile to 1 inch, shows, the Cobalt series forms a contact with the Keewatin. At the contact the Keewatin consists of greenstone, or basalt, and a dike of feldspar-porphyry. That the conglomerate and breccia of the Cobalt series, here resting on the Keewatin, has for the most part at least, originated *in situ* is shown by the fact that it contains fragments of various sizes of the porphyry dike. These fragments range in form from angular to sub-angular and rounded (Fig. 36). Both the greenstone and the porphyry, but more especially the latter, show characteristic torsion cracks, Fig. 25, being from a photograph of these rocks.

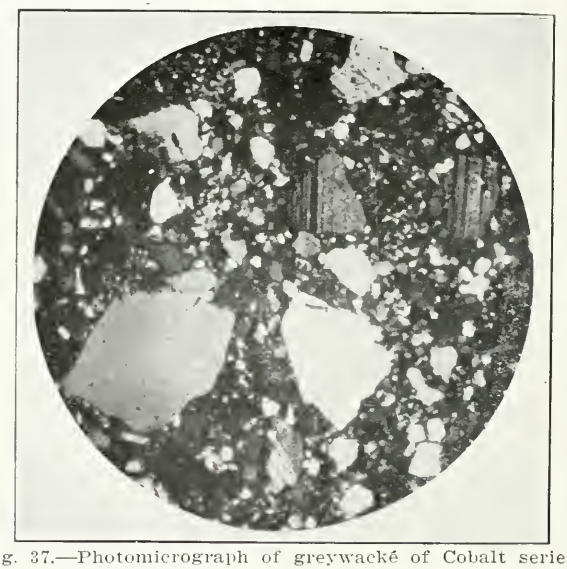


Fig. 37.—Photomicrograph of greywacké of Cobalt series.

This contact and others in the district, between the Cobalt series and the older rocks, have a striking resemblance to those which have been described as existing between members of the pre-Cambrian, Torridonian and the older Lewisian, of the Northwest Highlands of Scotland. "The observer may climb one of these Archæan hills, following the boundary between the Lewisian and the younger formation, and note, step by step, how the sub-angular fragments of hornblende-schist that fell from the pre-Torridonian crags are intercalated in the grits and sandstones, thus indicating the slow submergence of the old land-surface beneath the waters of Torridonian time."*

"The basal breccias which often flank the buried mountains are, as already explained, of the nature of scree material. They consist of fragments of the local rocks embedded in a sandstone matrix. The conglomerates, on the other hand, are probably torrential deposits brought down from a district very different in geological structure from that of the area in which the Lewisian gneiss occurs."†

*The Geological Structure of the North-West Highlands of Scotland, p. 4. Memoir of the Geological Survey of Great Britain.

†Idem, pp. 286-7.

Slate-like Greywacke

Normally, the basal conglomerate and breccia pass gradually upwards into fine-grained, delicately banded, slate-like greywacké (Fig. 37). The components of the greywacké are so fine in grain that they cannot be distinguished except by examination of thin sections under the microscope. When thus examined they are found to consist, for the most part, of angular fragments of quartz and feldspar, which is usually quite fresh and undecomposed (Fig. 37). The feldspar consists of orthoclase, microcline and the more acidic soda-lime varieties. Grains of glassy volcanic rocks, and of iron ore and other material have also been observed. Chlorite and other decomposition products are present. Under the microscope certain thin sections of the greywacké resemble volcanic ash. It has not been proved, however, that there was contemporaneous volcanic activity.

Typically, the slate-like greywacké has a greenish or greyish color, but in certain localities the color of the rock is distinctly reddish. The latter color is not found in the greywacké of the productive part of the Cobalt area proper, but reddish grey-

Fig. 38.—Fragments of slate-like greywacké, cemented together by light-colored arkose.

wacké lies both to the west and to the east, outcropping in the western half of Coleman township, near Latchford on the Montreal river, and at two or three points near the shores of lake Temiskaming.

The greywacké, like the other members of the Cobalt series, lies usually in an almost horizontal position. Ripple or wave marks are frequently seen on the surface of its beds, *e.g.*, in the cliff at the Little Silver mine on the Nipissing property. Mud cracks are occasionally present. While usually showing little evidence of disturbance, the greywacké is quite compact and does not split readily along the junction of many of the beds.

Normally, the greywacké passes upwards into quartzite, more or less impure, and the latter into conglomerate, but at times the quartzite is lacking and the greywacké is succeeded by conglomerate. Where the members of the series are complete, as at some points along the eastern shores of lake Temiskaming, the conglomerate appears to be succeeded without unconformity by what has been called the Lorrain arkose and quartzite, the latter of which is frequently interbanded with pebbly material.

At two or three places, however, where the upper members of the series, conglomerate or arkose, lie directly on the greywacké without the quartzite or other

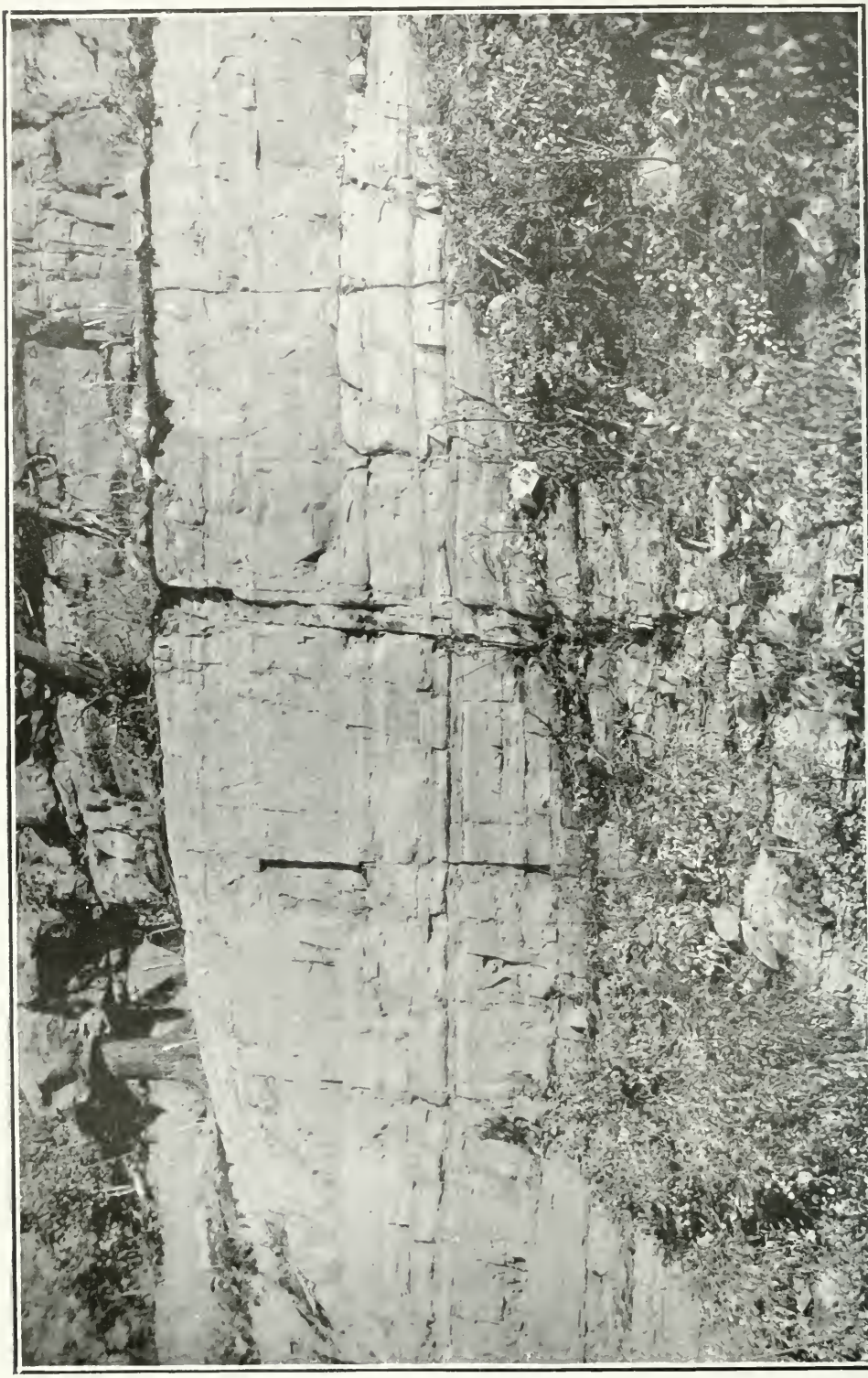


Fig. 39.—Slate-like greywacké of the Cobalt series, resting in almost horizontal position, Nipissing mine, Cobalt.

intermediate member being present, the greywacké appears to have been eroded before the deposition of the overlying rock. On lot 4, in the twelfth concession of Lorrain township, a striking contact, and unconformity, between the lower slate-like greywacké and overlying arkose is to be seen. The surface of the dark colored greywacké has been broken into angular fragments, the spaces between which are filled in and cemented by the light colored arkose (Fig. 38). The feldspar grains in the arkose are remarkably fresh, some of them retaining the pink color characteristic of orthoclase or microcline.*

This unconformity, between the greywacké and arkose, should in all probability not be considered to represent a great time interval or period of erosion. To use a term that has been employed in other regions, it may be called an interformational unconformity.

The unconformity is the only one that has been observed between members of the Cobalt series in the Cobalt area proper or in the immediately surrounding areas. At one point near Obushkong lake in Gowganda, however, a similar unconformity has been observed between the greywacké and overlying conglomerate.

Where the thickest and most complete sections of the Cobalt series are found, *e.g.*, on the east shore of the northern part of lake Temiskaming, there appears to be no break in the series, the passage from the greywacké, quartzite and conglomerate below to the Lorrain arkose and quartzite above being unbroken.

Thickness of the Greywacke

The thickness of the more typical, delicately banded greywacké is variable. Usually, at the bottom of the series, greywacké forms the matrix of the lower conglomerate and breccia. On passing upward the coarse fragments disappear. In some places the greywacké has a thickness of only a few feet, but there are frequently thirty or forty feet or more exposed. (See preceding table of thickness of members of the Cobalt series).

Chemical Composition of Greywacke

The following table shows the composition of samples of the delicately banded greywacké from the Little Silver cliff on the Nipissing property at Cobalt. The analysis was made by Mr. A. G. Burrows.

ANALYSIS OF SLATE-LIKE GREYWACKE

	Per cent.
Silica	62.74
Alumina	16.94
Ferric oxide	5.07
Ferrous oxide	1.59
Lime	1.39
Magnesia	3.05
Soda and potash	6.07
Moisture	.36
Loss above 110 degrees	3.20
Total	100.41

*The contact on the lot mentioned was recently revisited by Messrs. Cyril W. Knight and A. G. Burrows, who are inclined to doubt the evidence of erosion, and to call the rock at the contact crush-breccia.

ANALYSIS OF BRECCIA

A sample of the breccia of medium grain, from the wall of La Rose vein, was found to be more basic in composition than the greywacké, as the following result of analysis shows:

	Per cent.
Silica	43.12
Alumina	19.74
Ferric oxide	5.72
Lime	5.40
Magnesia	7.48
Soda	4.50
Potash	1.75
Cobalt and nickel	.55
Loss on ignition	10.94
Arsenic	1.18
Total	100.38

The sample showed in places the greenish arsenate of nickel and also bright specks of a light colored mineral, evidently smaltite or chloanthite.

Fig. 40.—Columnar jointing perpendicular to the planes of bedding in slate-like greywacké. The structure is due to the effects of intrusive diabase on the slate. A section of a small column is on top of the larger one. Lot 15 in the first concession of Bucke.

Columnar Structure

Where trenches or open cuts have been excavated on certain veins, the greywacké is seen to have a well developed columnar structure, the columns being vertical. Such a structure in this rock is also well developed in the railway cut near the shore of Cobalt lake, a short distance south of the station.

The well banded greywacké-slate on the north part of lot 15, in the first concession

of Bucke, has this columnar structure very perfectly developed in it (Fig. 40). The columns here have a much smaller diameter than those just mentioned. They are developed at right angles to the bedding of the slate, which is almost flat-lying, and they are nearly as perfect in form as columns found in basalt. On this lot in Bucke the columns are developed at the contact of the slate with intrusive diabase. That columnar structures of this kind are not uncommon in fragmental rocks is seen from the following statement: "Contact with eruptive rocks has frequently produced a prismatic structure in the contiguous masses. Conspicuous illustrations of this change are displayed in sandstones through which dykes have risen. Independently of the lines of stratification, polygonal prisms, six inches or more in diameter, and several feet in length, starting from the face of the dyke, have been developed in the sandstone."*

Quartzite

Normally the slate-like greywacké is succeeded above by quartzite, more or less impure. In some places, however, the quartzite is absent, and the next member of the series, viz., conglomerate, rests directly on the greywacké.

The quartzite usually has no great thickness, frequently being only twenty or thirty feet, but in certain localities impure quartzite or greywacké that overlies the delicately banded greywacké has a much greater thickness.

At the Little Silver cliff, on the Nipissing property, the base of the Cobalt series is not exposed. Here there are fifteen or twenty feet of well-banded greywacké, overlying which there is about the same thickness of feldspathic quartzite. Above the latter are twenty or thirty feet of conglomerate (see Frontispiece). At times the quartzite is interbanded with greywacké.

Conglomerate

What may be called the second conglomerate, to distinguish it from the conglomerate and breccia that lie at the base of the well-banded greywacké, or in other words the conglomerate that overlies the quartzite, is one of the most interesting members of the Cobalt series. The great variety of pebbles and boulders that are found in this rock give to it an appearance that attracts attention. It contains boulders representing practically all of the numerous older rocks of the region. Whether it represents a glacial deposit, or whether it is of torrential or other origin, in the opinion of many observers, is undecided. Figs. 34, 35, 41, 42 illustrate the character of typical examples of this rock.

The conglomerate of the Cobalt series is distinguished from that of the Temiskaming series chiefly by the fact that pebbles and boulders of pink granite, rather coarse in grain, are characteristic of the former and not of the latter. This is owing to the fact that the granites of the region, that antedate the Temiskaming series, are typically grey in color, while the pebbles and boulders in the conglomerate of the Cobalt series have been derived from the pink colored Lorrain granite, which intruded the Temiskaming but is older than the Cobalt series.

Origin of the Conglomerate

In the first edition of this report, concerning the origin of the conglomerate it was said: "It is difficult to understand, for example, how certain large boulders of granite in the conglomerate, which forms part of the highest outcrops of the Lower Huronian (Cobalt series), have been carried so far from their parent masses. These large boulders are found over much of the district, and there are now no outcrops of granite in the neighborhood of many of them. . . . In the present state of our knowledge we have little warrant for claiming that the granite boulders, often two or three feet or more in diameter and distant a couple of miles from exposures of the rock, indicate glacial conditions during Lower Huronian times, although we have no proof to the contrary."†

*Geikie, Text-Book of Geology, p. 769.
†Fourteenth Report, Bureau of Mines, Ontario, Part II., p. 43.

Fig. 41.—Boulder conglomerate, Cobalt series, Drummond mine. The large boulder on the right hand side at the top is 30 inches in diameter.

A couple of years after this report was published Dr. A. P. Coleman, while on a visit to the Trethewey mine, discovered striated boulders in the conglomerate in an outcrop on this property† that have all the characteristics of those which are found in glacial deposits. Hence, Dr. Coleman, and other writers have decided that a certain part, at least, of the conglomerate of the Cobalt series is of glacial origin.

In the opinion of the present writer more evidence is required before the glacial origin can be accepted. Although for many years conglomerates similar to those of Cobalt have been studied over a vast extent of territory in northern Ontario, no glaciated surface on the rocks underlying this conglomerate has been discovered. During the last few years several workers in the Cobalt and surrounding areas have diligently searched for such a surface, but without success. The underlying rocks present, characteristically, a weathered surface, there being no sharp line of division between the underlying undecomposed, or non-disintegrated, rock and the overlying fragmental rock. The glacial origin of the Cobalt conglomerate cannot therefore be proved so clearly as it can for similar rocks in other parts of the world. The Dwyka of South Africa, for example, rests on rocks that frequently show undoubted evidence of having been smoothed by glaciers.

A glacial origin was at one time suggested for certain breccias or conglomerates in the Torridonian of the Northwestern Highlands of Scotland. In the report on that region, published a few years ago, this suggested theory of origin has been discarded.* "From the nature of the rocks it may be inferred that the conditions of deposit were probably those of a rapid accumulation in shallow water near a shore line, subject to violent currents and the influx of flood or stream-borne materials, with occasional intervals of quiescence during which the finer sediments were laid down. . . . In one instance, on the north side of Loch Maree, it has been observed that the blocks in the conglomerate have come from the hornblende-schist ridge of Ben Lair, and may have travelled a distance of three miles."

That surfaces on rocks resembling closely those produced by glaciers can be formed by other means is shown by the observations of Dr. E. O. Hovey.‡ In speaking of the accumulation of volcanic material on the side of Mt. Pelee, he says: "From time to time the coat of new material became water-soaked from the heavy tropical rains and slid down the mountain in more or less of a sheet avalanche. On the collecting ground of the steep upper cone, planation and grooving were not prominent, but on the middle ground of the Morne Saint Martin, where the force of the avalanches spent itself, planation and grooving were pronounced. In June, 1902, the striated surface of the old agglomerate, with here and there a heap of unassorted ash upon it, suggested closely the appearance of a regularly glaciated surface with its overburden of till."

Dr. Hovey says further: "Where the crevicing of the rock-mass has been favorable, the impact of stones hurtling down the stream bed has broken off chips from the bed rock, producing a good imitation of the 'chatter' marks made by a glacier."

If such surfaces are thus produced, undoubtedly the faces of pebbles and boulders in moving masses of rock are also grooved and striated in such a way as to be undistinguishable from those of glacial origin.

The, on the whole, definite order of deposition from breccia and conglomerate at the base upward through greywacké, quartzite and conglomerate, leaving out of consideration the overlying Lorrain arkose and quartzite, has the appearance of ordinary sedimentation and not that of deposition by glacial agency.

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†Am. Jr. Science, March, 1907. Journal of Geology, February-March, 1908.

*The Geological Structure of the North-West Highlands of Scotland, pp. 23 and 273. Memoirs of the Geological Survey of Great Britain, 1907.

‡Striation and V-shaped Valleys Produced by Other Than Glacial Action. Geol. Soc. Am., Vol. 20.

Fig. 42.—Coarse boulder conglomerate of the Cobalt series, Cobalt.

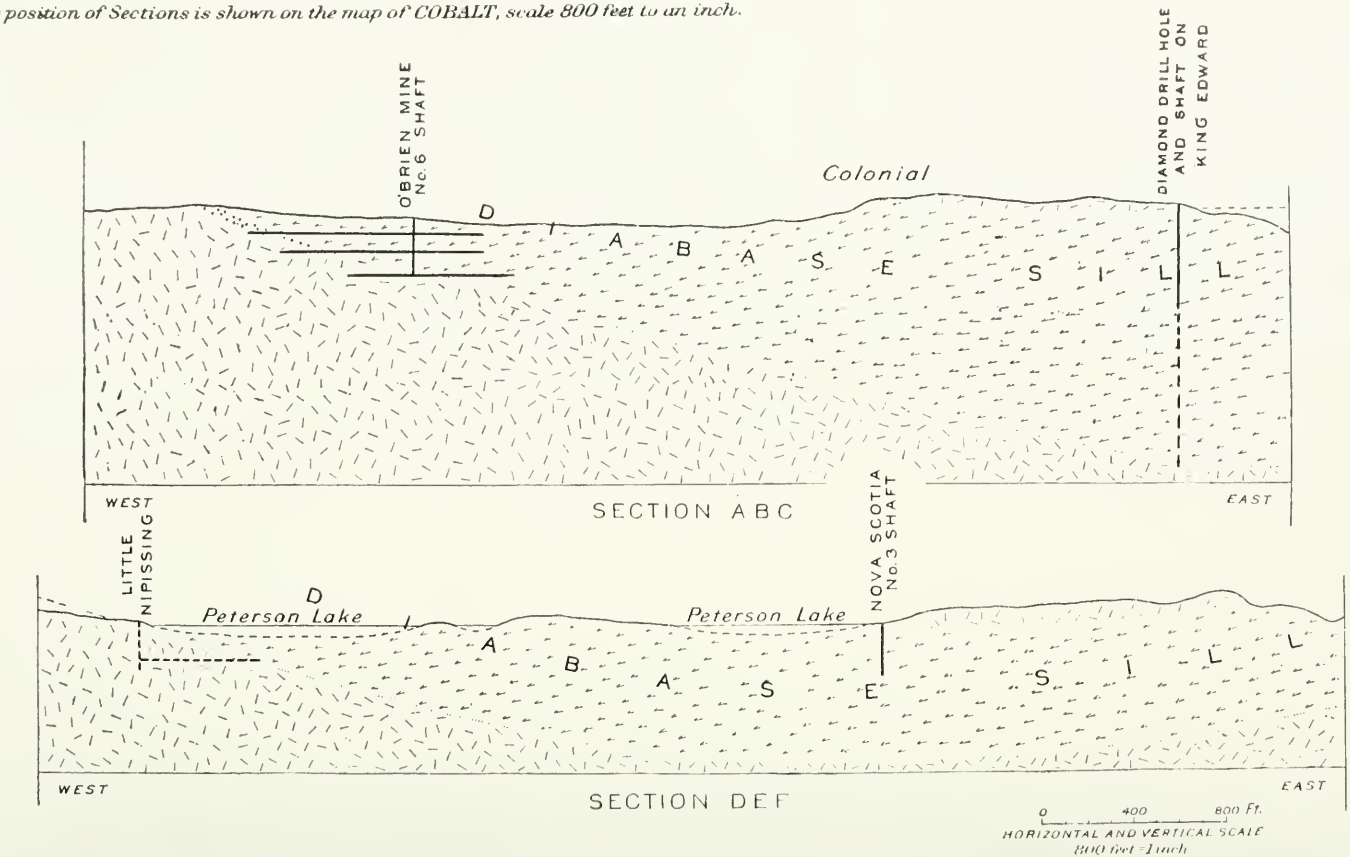
Lorrain Arkose and Quartzite

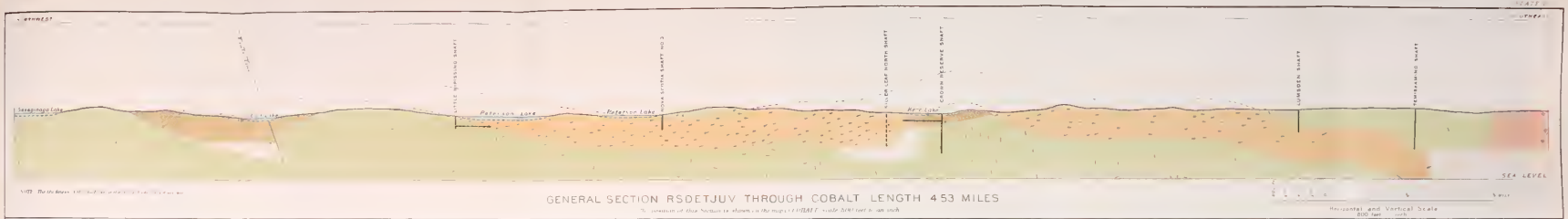
As explained on preceding pages the arkose and quartzite, to which the name Lorrain has been applied, are here grouped with the Cobalt series, and are considered to represent the upper members of the series. In two or three localities the arkose or quartzite has been found to be unconformable to the slate-like greywacké or other lower members of the series, but in other places there is no evidence of an erosion interval. Since, however, the arkose and quartzite in most of the areas that have been mapped tend to occur distinct from the lower members of the series they are distinguished on the maps, by a different color, from the latter.

Frequently the arkose is found on the surface of granite, *e.g.*, in the township of Lorrain, and is the decomposition product of the latter rock, there being a gradual passage from the undecomposed rock into the arkose. There is, moreover, a gradual passage upward from the arkose, first into impure quartzite, then into a purer quartzite and conglomerate, composed chiefly of quartz pebbles.

Fig. 42a.—Prospectors at Cobalt, May, 1904.

The position of Sections is shown on the map of COBALT, scale 800 feet to an inch.

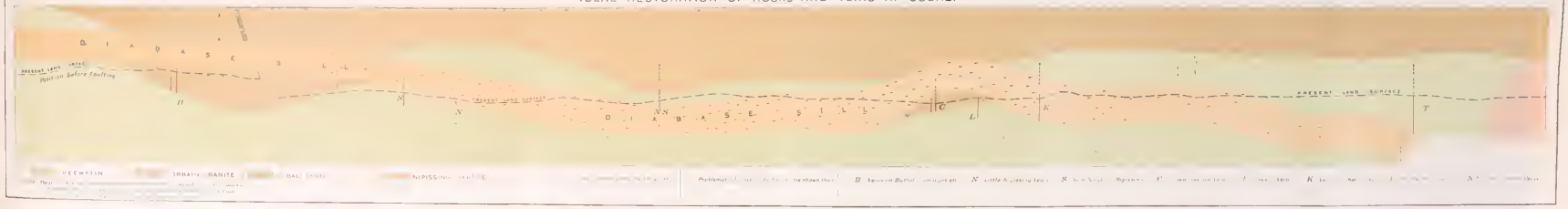




GENERAL SECTION RSDETJUV THROUGH COBALT LENGTH 4.53 MILES

Horizontal and Vertical Scale
800 feet = 1 inch

IDEAL RESTORATION OF ROCKS AND VEINS AT COBALT



THE NIPISSING DIABASE*

I. STRUCTURAL RELATIONS OF THE SILL

The data embodied on the cross-sections (plates I. to VI.), that accompany this report, have been collected from time to time during the past eight years, and were compiled by Mr. Knight. It was recognized in 1904, from a study of surface conditions, that the diabase occurred in the form of a sill or sheet. Since that time much underground work has been accomplished, which has shown more clearly the form and character of the sill. The cross-sections show that the sill rests at times almost horizontally on the underlying rocks, as may be seen, for instance, in the section through Mount Diabase—plate II, section G. H. In the Kerr lake area, however, it inclines steeply to the north and south at angles of 15 or 20 degrees, and in some cases at steeper angles. (Plate IV, general section.) As stated on a preceding page, the colored cross-sections went to press in December, 1911, but underground work since then has rendered it necessary to make minor changes. These alterations have been made on uncolored second editions of plates I, II and V.

The following notes give details of the cross-sections, the locations of which are shown on the map, scale 800 feet to 1 inch.

Section A, B, C, plate I

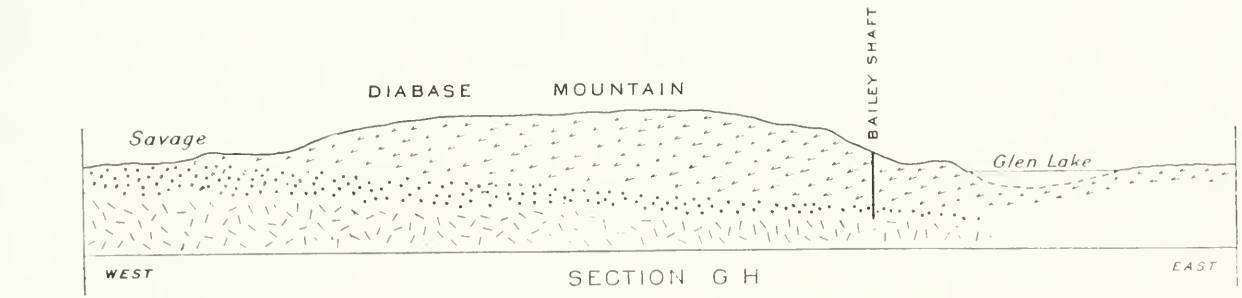
Number 6 shaft of the O'Brien mine passed from the surface downward through the Nipissing diabase and encountered the Keewatin series at a depth of 225 feet. The levels and other workings connected with this shaft cut the floor of the diabase sill at several other points. The dip of the sill is therefore known fairly accurately. At the bottom of the shaft it is, according to the late Mr. M. T. Culbert, some 7 or 8 degrees to the east, but near the surface it becomes much steeper. The top of the sill has been preserved at the Colonial, Silver Cliff and King Edward by a capping of Keewatin greenstone. At the latter property, which is now leased by the York-Ontario, diamond drill operations during February and March, 1913, have shown that the diabase has an apparent thickness of about 1,150 feet. At about 666 feet below the top of the sill, however, what was described by Mr. H. E. Jackman as a "clay seam" one inch thick was met with, and thin sections from this point examined under the microscope showed the rock to be crushed and brecciated. Possibly the clay seam represents a fault which makes the sill appear to be thicker than it really is. From the map, scale 1 mile to 1 inch, it will be seen that the longer axis of Cross lake is on a line which traverses, to the southeast, Kirk, Chown and Goodwin lakes. This line of lakes indicates, in all probability, a fault or a fold, more likely the former. A reverse fault, with plane dipping to the southwest at a low angle, would account for the thickness of the diabase met with in the drill hole.

Section D, E, F, plate I

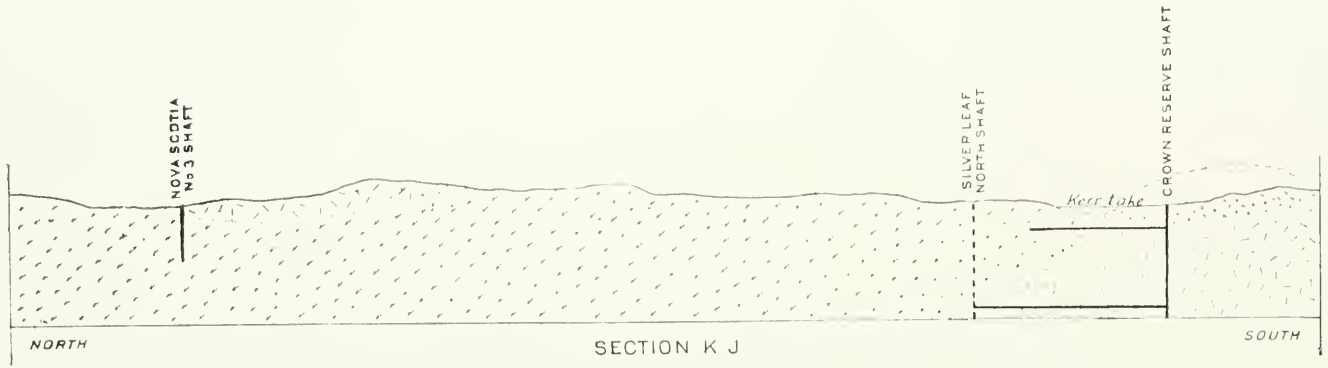
The first 10 feet of the Little Nipissing shaft is in the Nipissing diabase, below which the shaft is wholly in the Keewatin series. At the 160-foot level a drift runs easterly below Peterson lake a distance of about 500 feet, encountering Nipissing diabase the last 20 feet. The workings thus show that the sill dips to the east at an angle of about 16 degrees. In the cross-section the line indicating the floor of the diabase has been produced towards the Nova Scotia (where the top of the sill has been preserved), with gradually diminishing slope, in order to show the top and bottom of the sill in parallel position. In this manner the sill may be demonstrated to have a minimum thickness of 500 or 600 feet, but the actual thickness can of course only be determined by diamond drill or other means. The cross-section is about 400 feet south of the Little Nipissing shaft.

*Cobalt was originally in the judicial district of Nipissing. The diabase being widespread throughout this district, the name seemed a suitable one to give to it. On the earlier geological maps of the area we used the name post-Lower Huronian for the diabase, but it seemed best to adopt a simpler name. Recently the district of Nipissing has been subdivided. That part in which Cobalt is situated is now known as the Temiskaming judicial district. The district town is Haileybury.

The position of Sections is shown on the map of COBALT, scale 800 feet to an inch.



SECTION G H

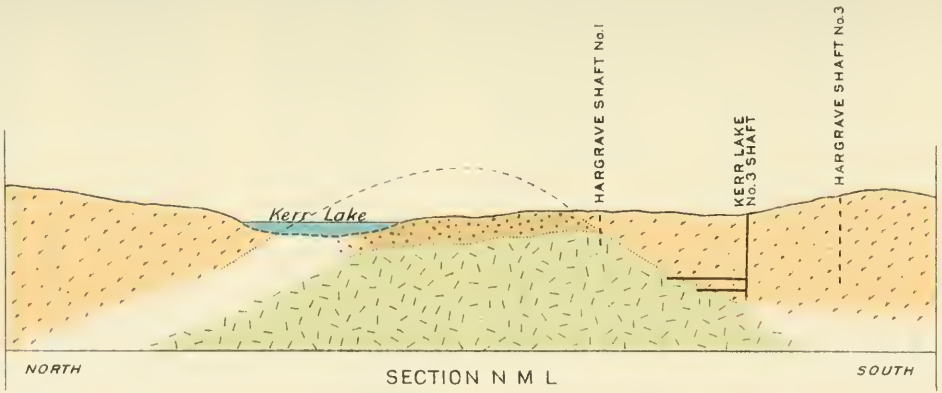


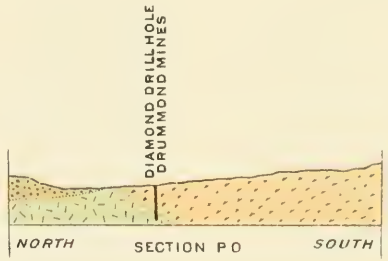
SECTION K J

0 400 800 Ft
HORIZONTAL AND VERTICAL SCALE
800 feet 1 inch

KEEWATIN COBALT SERIES NIPISSING DIABASE

The position of Sections is shown on the map of COBALT, scale 800 feet to an inch





0 400 800 Ft.
HORIZONTAL AND VERTICAL SCALE
800 feet = 1 inch

KEEWATIN

COBALT SERIES

NIPISSING DIABASE

To accompany Fourth Edition of Report by WILLET G. MILLER, Provincial Geologist, on the Cobalt-Nickel Arsenides and Silver Deposits of Temiskaming. In Part II of the Nineteenth Report of the Bureau of Mines, Ontario.

Section G, H, plate II

The Bailey shaft, on the eastern face of Mount Diabase, passes through 220 feet of diabase, after which 30 or 40 feet of flat-lying, slate-like greywacké of the Cobalt series are cut, followed by the Keewatin series. According to these figures the dip of the sill between the Savage and Bailey is 4½ degrees to the east. Probably the almost horizontal position of the sill in this area is due to the fact that the diabase has been intruded between the bedding planes of flat-lying greywacké slates. In other parts of the area where it has cut the complex Keewatin series or the conglomerates of the Cobalt series—which latter are for the most part devoid of regular bedding planes—it has irregular dips.

Section K, J, plate II

At the 100-foot level of the Crown Reserve shaft—which is in conglomerate, greywacké, etc., of the Cobalt series between this level and the surface—a drift runs northerly under Kerr lake. At a distance of 480 feet from the shaft the Nipissing diabase, resting on greywacké slates parallel to the bedding planes, is encountered, showing a dip of about 17 degrees to the north. On the same level in a nearby drift the dip is much steeper, being 45 or 50 degrees. The Silver Leaf north shaft on the north side of Kerr lake has been sunk 500 feet, and a crosscut run from the 480-foot level, southerly to the main shaft of the Crown Reserve. The former shaft, from the surface to about the 410-foot level, passes through Nipissing diabase, while the remaining lower part of the shaft and all of the crosscut pass through rocks consisting of lamprophyre, schist and diabase. The latter has, for the most part, an older, more decomposed appearance than the Nipissing diabase, and is made up of plagioclase and hornblende, together with epidote and zoisite. It may be, however, that there occur in this crosscut a few dikes from the Nipissing diabase.

The cross-cut shows no evidence of any great faults, but some minor slips are present.

Section N, M, L, plate III

No. 3 shaft, at the southeast corner of the Kerr lake mine, has been sunk in the Nipissing diabase. From the 274-foot and 322-foot levels drifts have been run to the north, passing through the diabase and cutting into the Keewatin series in both cases. At the No. 1 shaft of the Hargrave the diabase was passed through at the first level. It is thus seen that the dip of the diabase sill is 25 to 35 degrees to the south, the steeper angle obtaining towards the surface.

Section P, O, plate III

A vertical diamond drill hole on the south lot of the Drummond mine passes through 117 feet of diabase before entering the Keewatin series. The point of contact of the diabase on the surface is known, and the inclination of the diabase may thus be calculated to be about 35 degrees to the south.

General Section, upper half of plate IV

The section incorporates much of the information contained in the preceding sections, together with additional data. Its total length is about 4½ miles, and it may be added that the bottom line represents sea level. The cross-section begins at the southeast corner of Sasaginaga lake, and shows the important area of conglomerate, greywacké, etc., of the Cobalt series resting in an ancient valley of the Keewatin series between Cobalt and Sasaginaga lakes. A reverse fault—normal to the line of section—occurs parallel to the longer axis of Cobalt lake, and it is also found at the McKinley-Darragh and Princess at the south end of the lake, and at La Rose and Right of Way at the north end of the lake. (See plates V and VI.)

At La Rose mine the rocks on the west side of the fault have been carried down a vertical distance of 210 or 220 feet, and at the McKinley-Darragh a vertical distance of at least 250 feet.

The diabase at the Little Nipissing has already been shown to dip easterly at an angle of about 16 degrees, while at the Crown Reserve it has been proved to dip more steeply at angles varying from 17 to 45 or 50 degrees to the north, from which it appears that the sill occupies a basin-like depression in the underlying rocks between these two properties.

If the Kerr lake area be now studied it will be found that the diabase inclines more or less steeply to the north and to the south of the axis of the lake, forming a saddle-like structure. It may be seen dipping northerly at the following points: the southwest shore of Cross lake; the northeast corner of the north Drummond lot; about 200 yards east of Kerr lake and 25 yards north of the road; (a diamond drill hole near here has also proved the dip to be northerly); a trench on the Silver Leaf has exposed the contact of the diabase for about fifty yards or more. On the south flank of this saddle-like structure the diabase has been proved to dip southerly at the following points: the Valentine shaft; a vertical diamond drill hole on the south part of the south Drummond lot (see plate III, section P O; shaft No. 5 of the Drummond; shaft No. 1 of the Hargrave; two drifts from the No. 3 shaft of the Kerr lake (see plate III, section N M L); a drift from the 369-foot level of the No. 3 shaft of the Hargrave. From the above data it is thus seen that the saddle-like structure of the Nipissing diabase at Kerr lake has been proved at several points. But it may be added that some of the steep inclinations of the sill may be partly due to faulting. There is, for example, a well defined fault in the diabase at the Crown Reserve, 540 feet north of the shaft in the drift at the first level, dipping 15 or 20 degrees to the north. Again on the south side of the saddle-like structure a fault, dipping to the southeast, was encountered at the Hargraves and Drummond.

At the Lumsden a shaft was sunk in the Keewatin to a depth of 290 feet, where it passed into the Nipissing diabase, proving that the sill here dips beneath the Keewatin greenstones at an angle of 25 or 30 degrees. Similar relations are known to obtain at other points along the same contact to the southwest as far as Mount Greywacké.

Coming, finally, to the Temiskaming mine it is found that the Nipissing diabase has been encountered on the fourth and fifth levels, and at a depth of 575 feet in the main shaft. The surveys show that the sill dips at angles varying from 17 to 30 or 40 degrees in different parts of the mine, but it is probable that faulting may have caused some of the steeper inclinations, because a vertical fault between the diabase and Keewatin is known to occur on the fourth level. There are, however, no data at present to determine the throw of this fault.

Ideal Restoration, lower half of plate IV

An attempt is made in this plate to picture conditions during pre-Cambrian times, before erosion and faulting of the sill had taken place.

It will be noted that the position of the present land surface and the Cobalt lake fault are shown. It is obvious that, in restoring the part west of the fault to its position prior to displacement, the broken line showing the present land surface must, of course, be moved upwards a distance equal to the vertical throw. If this point is not considered when studying the cross-section one might, at first glance, get the erroneous impression that a normal fault had occurred, carrying down the east side of the lake, but the unbroken and continuous position of the diabase sill and floor of the Cobalt conglomerate will show that this is not the case.

Section Y, Z, plate V

The cross-section shows the great fault at La Rose mine as it has been worked out at and near the main shaft. It is a reverse fault, with a steep south-easterly dip at the surface which becomes less on the lower levels. There is a vertical displacement of 210 or 220 feet, but the extent of the horizontal movement has not been ascertained.

On the first level, 45 feet south of the main shaft, a drift runs west under the railway to the boundary of the property. The fault is encountered at a distance of

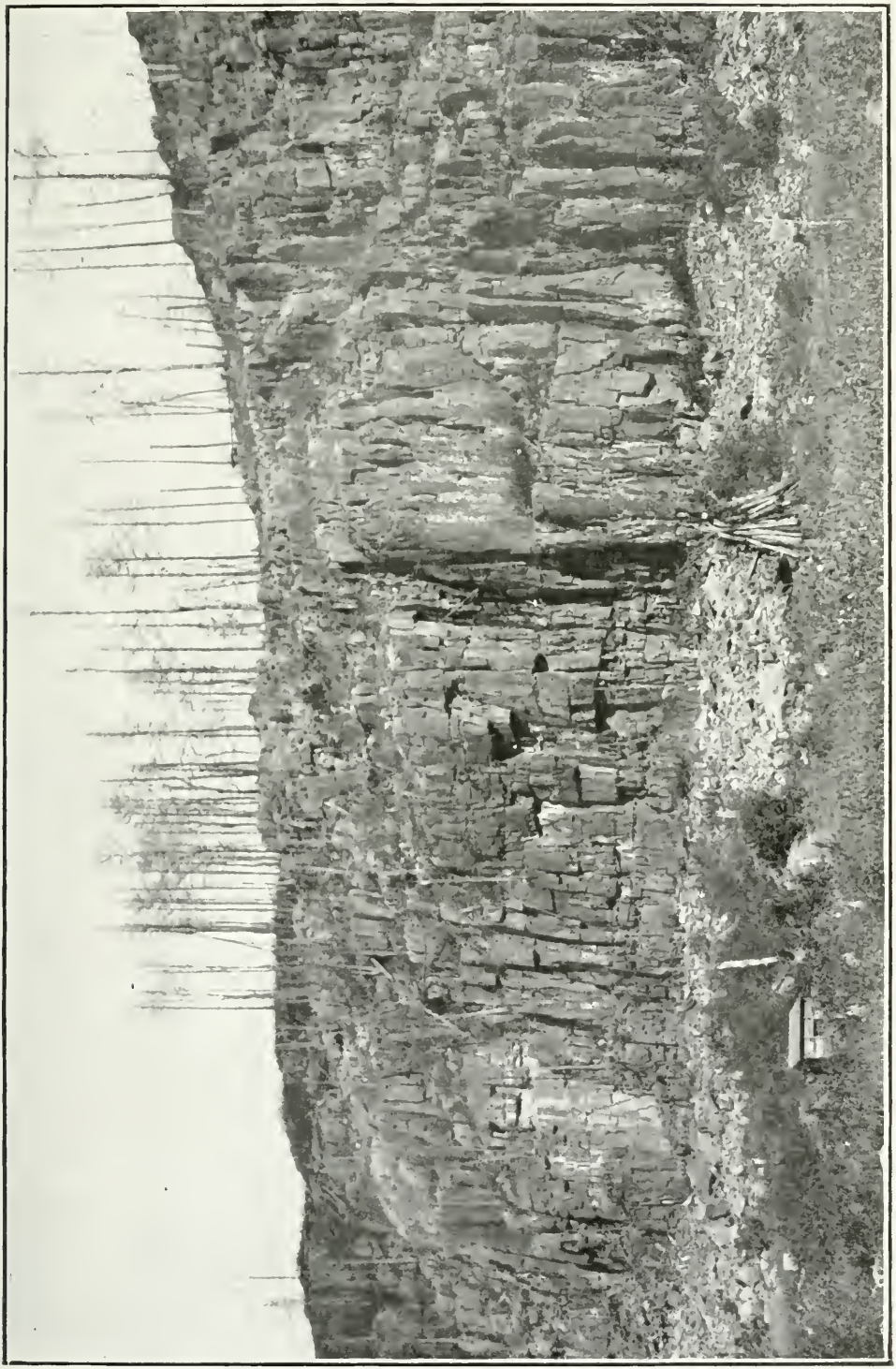


Fig. 43.—Nipissing Diabase, west face of Mount Diabase, Cobalt.

55 feet in this drift, and is well defined, because the Nipissing diabase sill has been carried down and a small uneroded patch now lies against the Cobalt series of sediments. The roof of the drift for 25 feet west of the fault, and the floor for 10 feet west, is diabase. On the surface the diabase outcrops west of the railway tracks, opposite La Rose main shaft.

On the second level the fault occurs 43 feet immediately west of the main shaft in a drift where coarse boulder conglomerate has been faulted down against fine-grained greywacké. The contact of the Cobalt series and the Keewatin greenstones occurs on this level at the main shaft.

On the third level the fault is found 12 feet east of the centre of the main shaft, and it may also be seen in the shaft itself at the top of the first ladder above this level. At these points the fault line is well shown, because the conglomerate and greywacké abut against the Keewatin greenstones.

In the winze at the third level the fault is met with several feet below the collar of the shaft.

At the 380-foot level the fault is again encountered in an easterly cross-cut 118 feet from the winze. Regarding operations at this point, R. B. Watson, the general manager, says in the sixth annual report of La Rose Consolidated Mines: " . . . The fault has been followed both ways for a total distance of over 500 feet. A strong vein of calcite, in places three feet wide, lies along the fault; it carries some silver throughout, but no high grade ore has been developed."

Finally, at the 500-foot level, a drift, which runs easterly, meets the fault 236 feet from the winze. A calcite vein, similar to that at the 380-foot level, also occurs in the fault here.

It is believed that the fault is younger than the veins because of the absence of any important amounts of silver or arsenides in the fault itself. A few ounces of silver per ton have been obtained from some samples in the fault. It is likely, however, that there have been recurrent movements, extending over a vast period, along or close to the line now occupied by the fault. Hence, it would be expected that veins might be found lying parallel to the fault, and some of them might have been reopened at the time the chief faulting took place.

Section W, X, plate VI

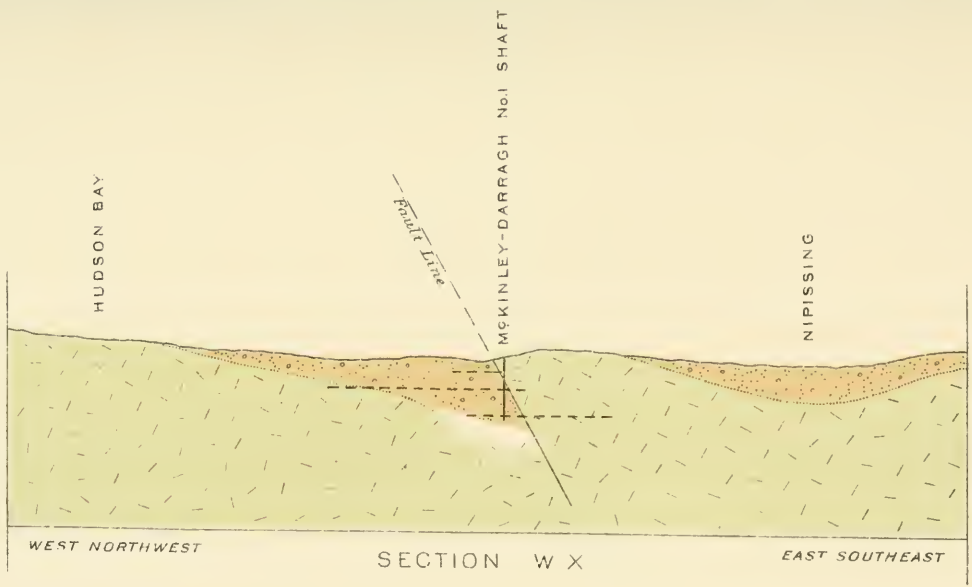
The fault at La Rose continues southwesterly through Cobalt lake, where it has been met with in the workings, and passes through the McKinley-Darragh and Princess. It is more striking at the McKinley-Darragh than at La Rose because in every case where it has been encountered on the three levels conglomerates, etc., of the Cobalt series abut sharply against the Keewatin greenstones. It dips southeasterly at an average inclination of about 60 degrees, and the throw has been proved to be at least 250 feet, but is believed to be greater. Mr. P. A. Robbins found ore in a brecciated condition in the fault, and considers the latter to be younger than the veins. As previously said, there may, however, have been recurrent movements along the line of weakness, extending throughout a vast interval of time. The rock on each side of the fault is much broken. Other minor displacements occur, some of them being later in age than the veins.

Openings Through which Diabase Ascended

In the Cobalt area proper the diabase, as will be seen from the accompanying cross-sections and descriptions, is in the form of a sheet or sill, which has intruded all the older rocks of the area. While there are local variations, the dip of the sill, on the whole, is at a low angle, 15 or 20 degrees, to the east or southeast. While it cannot be definitely proved, it appears that all the diabase of the sill at Cobalt came from a single opening. In the surrounding areas the diabase probably came from other openings.

On a preceding page it is suggested that the absence, in the veins of Cobalt, of barite and fluorite, characteristic minerals of similar cobalt-silver veins in other parts of the world, is to be accounted for by the fact that the diabase and mineral-bearing solutions in ascending followed for a considerable distance an almost horizontal direction, shown by the dip of the sill. Barite and fluorite, which are usually among the

The position of Section is shown on the map of COBALT, scale 800 feet to an inch.



0 400 800 Ft.
HORIZONTAL AND VERTICAL SCALE
800 feet = 1 inch.

KEEWATIN

COBALT SERIES

To accompany Fourth Edition of Report by WILLET G. MILLER, Provincial Geologist, on the Cobalt-Nickel Arsenides and Silver Deposits of Temiskaming. In Part II. of the Nineteenth Report of the Bureau of Mines, Ontario.

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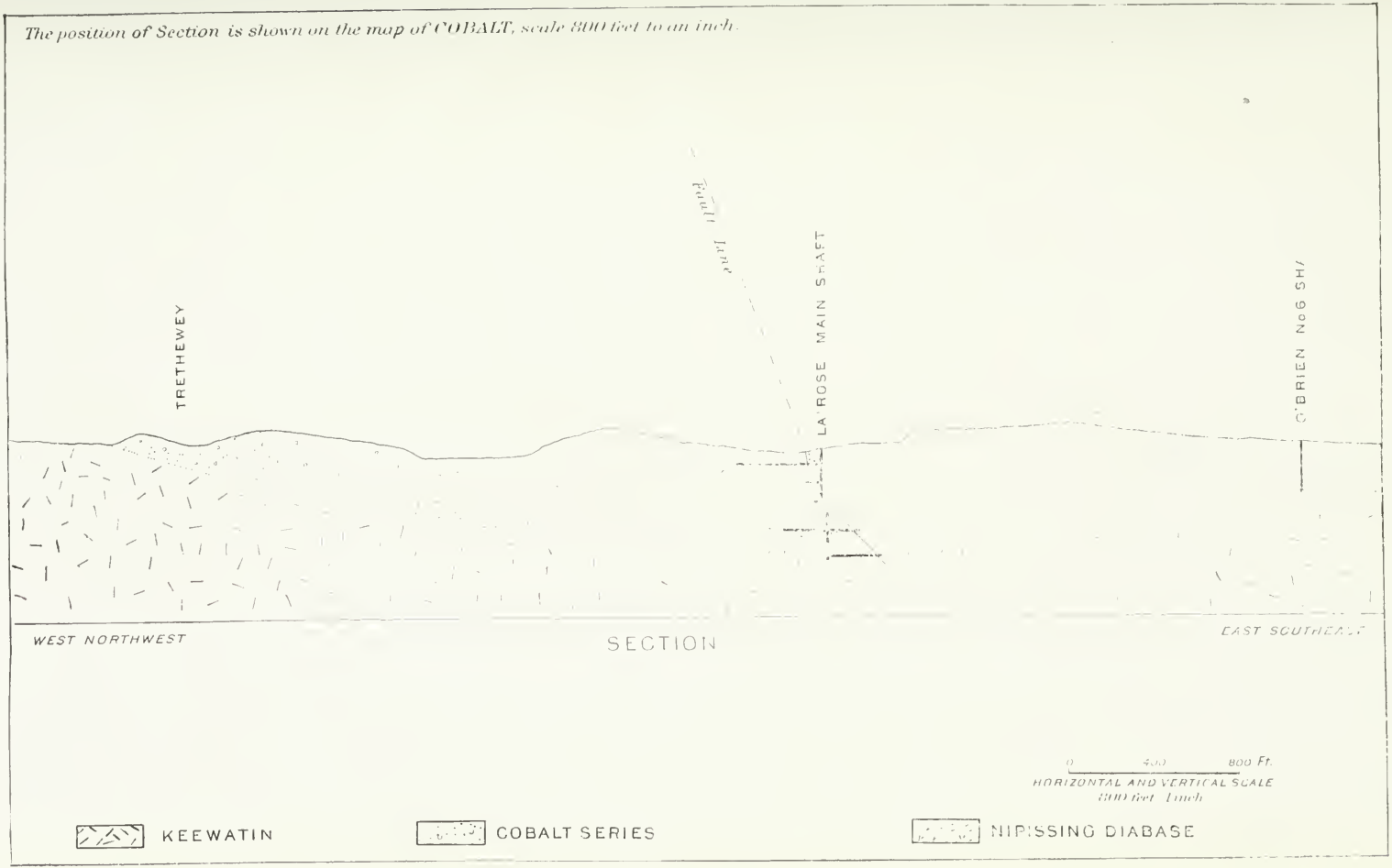

first of the minerals to be deposited in such veins, would probably be precipitated before the solutions reached the part of the area where the veins are now found.

One or two veins in the diabase near Elk lake, and a few small ones in the same rock in the Gowganda area, contain barite. This mineral and fluorite are found in veins carrying native silver in the township of Langmuir, near Porcupine. It would seem that these veins in the outlying areas owe the presence of the minerals to the fact that the diabase has risen in a more vertical direction than at Cobalt.

Sills Elsewhere

The hypabyssal rocks, such as diabase, basalt and andesite, are more frequently found as sills than are the deeper seated rocks: granite, syenite and others.

Many sills of diabase, or closely related rock, are known. For instance, on the north shore of Lake Superior, near Port Arthur, there are sills of great extent.

The palisades of the Hudson, New York, are formed by a sheet or sill, the outcrop of which is 70 miles long from north to south, and its thickness varies from 300 to 850 feet; the dike which supplied this immense mass is exposed in a few places along its western side.*

In the north of England the Great Whin sill, somewhat like that of Cobalt in chemical composition, is another famous example. It is traceable for a distance of 80 miles and has a total area of perhaps not less than 1,000 square miles. It varies in thickness from less than 20 to as much as 150 feet, but averages from 80 to 100 feet.†

It is thus seen that the size of the productive area at Cobalt is small when compared with the known horizontal extent of certain sills elsewhere.

2. MICROSCOPICAL AND CHEMICAL NOTES ON THE DIABASE

In the first and second editions of this report this diabase was spoken of as "diabase and gabbro" owing to the fact that some varieties are coarse in grain and thus resemble gabbro. Mr. Knight has found, however, that nearly all varieties of the rock from the Cobalt area, examined by him, possess an ophitic texture and should be called diabase. Primary quartz is almost always present in this diabase.

This rock, as will be seen from the maps, occupies a considerable part of the Cobalt area. Good contacts are found, especially between it and the Cobalt series. A contact of diabase with the Lorrain quartzite can be seen along the shore of Temiskaming a short distance north of Martineau bay, and elsewhere.

That the cobalt ores in all probability came from the same magma as the diabase is made evident from the association of these ores with the rock over a large territory.

Elsewhere in this report it has been stated that the Nipissing diabase is often much like some of the coarser varieties of basic rocks which are found in the Keewatin. Representatives of the latter, especially on freshly broken surfaces, have a more weathered and altered appearance than have Nipissing representatives.

Mr. Cyril W. Knight has furnished me with the following detailed descriptions of types of the diabase from various parts of the Cobalt area.

For a microscopic description of the diabases outside of the immediate vicinity of Cobalt, Dr. Barlow's report on the Temiskaming map sheet may be consulted,‡ and the papers by W. H. Collin§ and N. L. Bowen.‖

In many cases the microscope must be made use of in order to detect the ophitic texture, because it is not often that this texture can be made out with the naked eye. The grain of the rock is very uniform, the individuals of augite and plagioclase probably averaging between 1-16 and 1-8 of an inch in length. There are, however, places where it is very much coarser than this, as for example on the north shore of Peterson lake, near the creek.

The main point brought out in the following description is the fact that two-thirds of the thin sections examined contain primary quartz though seldom in considerable amount. They are therefore quartz-diabases. The quartz is almost always associated

*W. B. Scott, An Introduction to Geology, 1897, p. 280.
†Geikie, Text-Book of Geology, p. 733.
‡Annual Report Can. Geol. Sur., 1897.
§Economic Geology, Sept., 1910.
‖Jour. of Geol., Oct.-Nov., 1910.

with feldspar in what is known as a micrographic intergrowth, so that its primary nature may, therefore, be safely assumed.* This intergrowth is the last constituent to crystallize out and occurs between the interstices of the other minerals. In this connection it is interesting to note that some of the basic rocks (norite) at Sudbury also contain quartz, and both districts produce nickel and cobalt; the similarity of the two rocks is more fully discussed on pages 103-6. The quartz-diabases at Cobalt are evidently similar to those on the Blanche river, first rapids, described by W. G. Miller in the Bureau of Mines report for 1902, page 228.

(*a*) The diabase belt south of Kerr and Giroux lakes.

A thin section of the diabase near the southeast corner of the Kerr Lake property shows the rock to be a normal diabase and to consist of the following constituents: plagioclase, augite, biotite, magnetite and an odd grain of quartz.

The plagioclase occurs in long, relatively narrow rods, nearly always showing albite twinning lamellæ. The maximum extinction in sections at right angles to these lamellæ is 43 degrees, showing that the feldspar is labradorite ($ab_3\ an_7$). Zonal banding is seen in a few cases with crossed nicols. The mineral is usually fresh but has sometimes altered to epidote, chlorite, etc. The augite occurs in pale brownish, faintly pleochroic, allotriomorphic grains. In almost every case there is present a very fine lamination which is due to parting parallel to OP (001).† This parting is sometimes present to the exclusion of the ordinary prismatic cleavage of the pyroxenes and occurs in almost all the augite in the diabase at Cobalt. It is sometimes combined with twinning on the orthopinacoid, giving the "herring-bone" structure. A few irregular grains of biotite are present. This latter mineral is always a constant, though never prominent, constituent of the rock. A very small amount of quartz (not in micrographic intergrowth with feldspar) and some magnetite are present.

The plagioclase has crystallized out before the augite, so that rods of the former are found partly or wholly embedded in the augite. This is known as the ophitic texture, and the rock is therefore classed as a diabase.

A specimen from the east end of Giroux lake (from the centre of what is known as the "Nugget" claim) contains the same constituents as those in the section just described. The quartz, however, is present in large enough quantities to class the rock with the quartz-diabases, but better examples of that type of rock will be described later. Decomposition has broken down much of the plagioclase to saussurite, and much of the augite to fibrous hornblende, chlorite, etc. The basal parting in the augite is very marked.

A specimen from Dynamite island in Giroux lake shows the rock to be a normal diabase without any quartz. It consists almost wholly of labradorite and augite, with a very few grains of biotite and magnetite. An occasional rod of apatite is seen. The texture is ophitic, the labradorite occurring in rods partly or wholly embedded in the augite. This section (and that from the Kerr Lake property) is fresher than most of the Nipissing diabase at Cobalt.

The rock from Diabase point, Giroux lake, is a good example of a quartz-diabase. The quartz is intergrown with feldspar, showing a micro-pegmatitic texture; the feldspar in this intergrowth is usually too badly decomposed to determine its nature. The rock consists of labradorite, augite, quartz and small amounts of biotite and ilmenite (partly decomposed to leucoxene). The labradorite is not quite so basic as in other diabases which are free from residual quartz. The ophitic texture is marked.

As will be seen from the geological map of Cobalt, the diabase belt south of Kerr and Giroux lakes is about three quarters of a mile wide. A specimen from the south edge of it (S.E. corner of lot 2, con. IV) shows the rock to be badly decomposed. It consists of plagioclase, augite, quartz, ilmenite and biotite. The plagioclase is almost wholly altered to saussurite, the augite to green hornblende, chlorite, etc., and the

*Harker, p. 132.
†Rosenbusch Iddings, Pl. xix, fig. 6.

ilmenite to leucoxene. The quartz is in graphic intergrowth with feldspar. It is therefore classed as a quartz-diabase, the plagioclase having crystallized out before the augite, giving the ophitic texture.

A thin section near the northwest corner of the University mine shows the rock to be a quartz-diabase. The quartz, however, is not such a prominent constituent as in sections from other parts of the area. The plagioclase occurs in the usual rods, showing albite twinning lamellæ and giving extinction angles (in the zone normal to the twinning lamellæ) up to 36 degrees. The augite occurs in allotriomorphic grains, showing twinning parallel to both 101 and 001, the latter repeated, resulting in the basal lamination already described in other augites. Biotite is present sparingly. A few grains of magnetite occur. The texture is ophitic.

(*b*) The diabase area between Kerr and Peterson lakes (on the south and north) and between Cross lake and the west face of Mount Diabase (on the east and west).

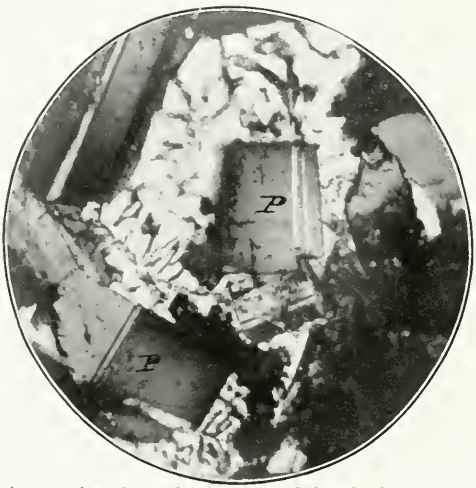

Fig. 44.—Quartz-diabase, showing plagioclase (labradorite P, embedded in a micrographic intergrowth of quartz and feldspar. From Diabase point, Giroux lake.

A specimen near the northeast corner of the Silver Leaf mine is a normal diabase similar to others already described. Northeasterly from this point about half a mile, a specimen was collected near lake Cyril. It consists of labradorite in the usual rods, augite showing the basal lamination so commonly found, biotite in accessory amount, magnetite, and quartz in graphic intergrowth with feldspar. The labradorite is badly decomposed, while some of the augite has been altered to uralite. There seems to be, however, some original hornblende present. The ophitic texture is well marked, placing the rock with the quartz-diabases.

(*c*) The diabase north of Peterson lake.

Good specimens may be obtained from the creek at the point where it leaves Peterson lake. The lake has been partly drained here by a small canal cut in the rock. The texture of the rock is unusually coarse, the augite individuals being sometimes half an inch in length. The labradorite occurs in shorter rods than is the case with most diabases, but it has crystallized before the ferro-magnesian mineral. The maximum extinction angle in the zone normal to the twinning lamellæ is 34 degrees. Much of it is decomposed to saussurite. The augite shows the characteristic basal lamination and some of it has decomposed to green pleochroic hornblende. Biotite in accessory amount is present. Quartz is found partly in graphic intergrowth with feldspar and partly by itself. In the latter case its primary origin may sometimes be in doubt. Some magnetite grains are noted. The typical ophitic texture is not well developed, but the plagioclase has crystallized before the pyroxene, and in a few cases the usual rods of the former are wholly embedded in the augite.

Northeasterly from here half a mile, on the Watts (King Edward), the thin section examined is less coarse in grain. The labradorite is in the usual rods, partly decomposed to saussurite. The augite occurs in allotriomorphic grains, showing the basal lamination, and it has in part been altered to uralite. The micrographic intergrowths of quartz and feldspar are more abundant than in any so far described. Ilmenite, mostly weathered to leucoxene, is also unusually abundant. The rock is a fine example of quartz-diabase.

Northerly from this point two-thirds of a mile (the northeast corner of the O'Brien) a thin section shows the rock to be a quartz-diabase. It is similar to others already described, consisting of labradorite, augite (showing basal lamination), quartz and feldspar in micrographic intergrowth, and small amounts of biotite and ilmenite (weathered to leucoxene). The texture is ophitic.

Five hundred feet due east from the point where the last specimen was taken the type of rock is a little different from the characteristic diabase at Cobalt. The plagioclase is an acidic labradorite (ab_1 an_1) partly in rods, partly in allotriomorphic grains.

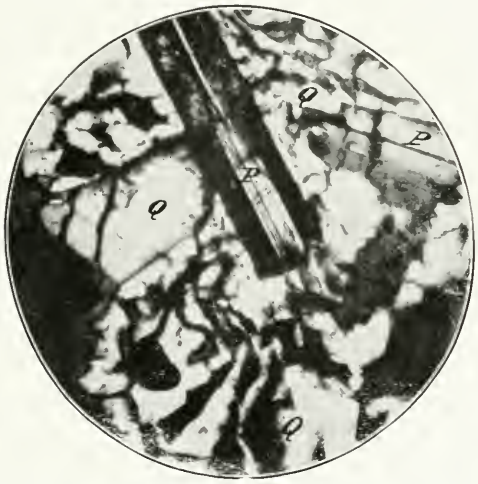

Fig. 45.—Quartz-diabase. P, plagioclase (labradorite) embedded in a micrographic intergrowth of quartz and feldspar, Q. From northeast corner of R L 403, O'Brien mine.

There is no augite present, its place being taken by a faintly pleochroic hornblende, occurring partly in rods but mostly in allotriomorphic grains. Some magnetite is present. Part of the plagioclase has crystallized before the ferro-magnesian constituent, while some has crystallized about the same time; hence the ophitic texture is not marked.

A specimen of the diabase from No. 6 shaft of the O'Brien mine was collected and examined by the late Mr. M. T. Culbert, who found it to contain a pyroxene with parallel extinction and low interference colors, and who considered it to be enstatite. A similar mineral occurs in some of the diabases described above. Mr. N. L. Bowen* has also found enstatite in a thin section from the diabase at Gowganda, and says that "the slide presents no difference whatever from the diabase of the Cobalt area."

The diabase on the west part of La Rose property does not differ materially in composition or texture from the typical outcrops in other parts of Cobalt, except that it is finer in grain. Rods of labradorite set in allotriomorphic grains of augite essentially constitute the rock, and the usual decomposition products have resulted in places. Ilmenite and a small amount of quartz and feldspar in micrographic intergrowth are also present. This diabase outcrop on the west side of the railway, opposite La Rose mine, is on the downthrow side of a fault.

*Jour. Geo., Oct.-Nov., 1910.

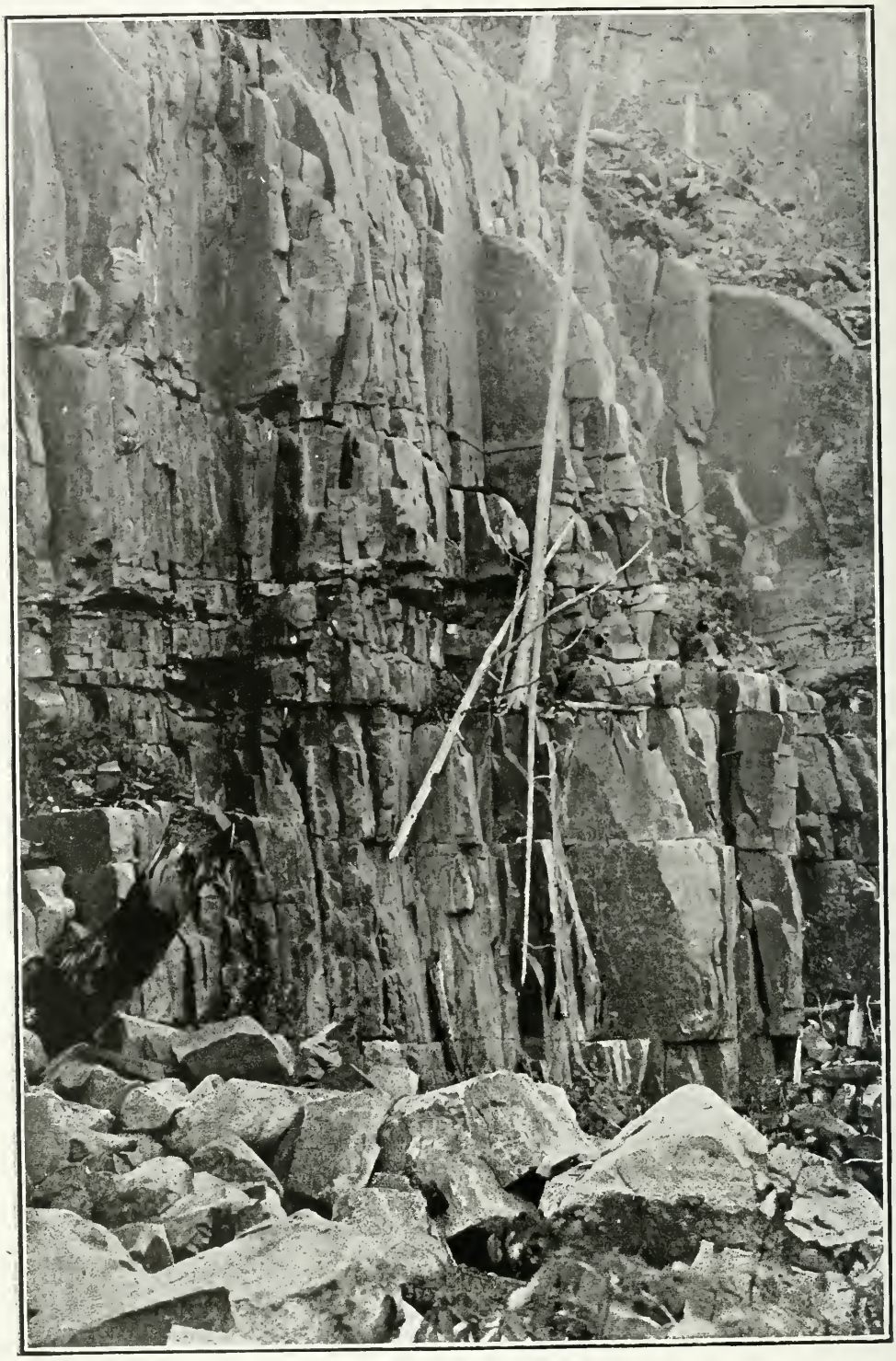

Fig. 46.—Jointing planes in diabase on west face of Mount Diabase, Cobalt.

Three sections were examined which are a little outside the Cobalt silver area proper. They are all quartz-diabases. One of them, taken beside the Temiskaming and Northern Ontario Railway between Bass and Mud lakes, shows the rock to contain labradorite, hornblende, small amounts of augite, abundant quartz in micrographic intergrowth with feldspar, and ilmenite. The labradorite is nearly all decomposed to saussurite and the hornblende present seems to have resulted from the augite. The texture is ophitic. Another specimen, also beside the railway, was collected about half a mile farther west, between Mud lake and the Montreal river. It is similar to the last specimen, with the exception that it contains accessory biotite.

A specimen from the Imperial Cobalt, near Portage bay, south part of lot 15 in the sixth concession of Coleman is seen to be much decomposed, and is represented now largely by green pleochroic hornblende. Rods of plagioclase, nearly always altered to secondary products (saussurite), can be seen embedded in hornblende giving the ophitic texture. The section contains considerable quartz in graphic intergrowth with feldspar, the latter in some cases twinned. It is this feldspar which gives the rock, like most of the diabase in the Portage bay area, the appearance of containing pink or reddish grains. The rock may be called a quartz-diabase. It contains more quartz than any of the diabase in the immediate vicinity of Cobalt.

(*d*) Note on chemical composition.

Mr. A. G. Burrows made silica determinations of two of the quartz-diabases. The SiO_2 content of the rock between Mud lake and the Montreal river is 51.14 per cent. The other determination was made from the quartz-diabase from Diabase point, Giroux lake. It contained 49.44 per cent. SiO_2. Rosenbusch gives analyses of two quartz-diabases showing a SiO_2 content of 51.15 and 55.25 per cent. Analyses are given on a following page.

Facies of the Diabase

While, as will be seen from the thin sections that have been described, the diabase in the productive part of the Cobalt area is fairly uniform in character, differentiation is found in the outlying areas. Thus, a few miles to the west and also to the south of Cobalt pink spots, areas of micropegmatite, appear in the diabase. In certain localities these pink spots increase until the rock becomes pink or reddish, and is then more correctly described as granophyre than as diabase. A similar, but more complete change from a basic, darker rock to a lighter colored, more acidic variety, is found in the norite of Sudbury.

At times the typical diabase passes into a rock much coarser in grain, that has been described as gabbro, but many of these coarser varieties, when examined closely, are found to have the ophitic texture.

DIKES OF APLITE OR GRANOPHYRE YOUNGER THAN NIPISSING DIABASE

Especially in the Elk Lake and Gowganda areas the Nipissing diabase is frequently cut by narrow dikes of aplite or granophyre. The material in these dikes is believed to represent residual, acidic segregations of the diabase magma. On the cooling of the diabase cracks were formed in it, and material from the residual magma rising through the cracks and fissures formed the dikes of aplite or granophyre. Chemical and microscopical examinations of these dike rocks show that they are genetically connected with the diabase rather than with granite. Compared with the fine-grained granite or felsite dikes in the region, such as those connected with the Lorrain granite, the aplite dikes associated with the Nipissing diabase are found to be characteristically high in soda and low in potash, as following analyses show.

At Cobalt there is a dike of granite on the property of the University mine that cuts the Nipissing diabase, and from its chemical composition is seen to be related to the aplites of Gowganda and Elk Lake. Having a much greater width than have the characteristic dikes elsewhere in the region, it is naturally coarser in grain. An analysis of samples from this dike is given below.

Examined in thin sections under the microscope the University mine dike rock is found to be made up of feldspar, quartz and a colored constituent. The feldspar predominates, and consists of microcline and an acid plagioclase showing fine albite twinning lamellæ. The quartz and feldspar occur in allotriomorphic grains, but in two instances show distinct micrographic intergrowths. The colored constituent is not abundant; it was apparently originally a mica, but is now represented by chloritic material.

This dike averages fifty feet in width, while the dikes of the Montreal river area and Gowganda are usually under eighteen inches.

Analyses

The table below gives analyses of the acid or granophyric facies of the eruptives at Cobalt and Sudbury, and brings out the chemical relations of the rocks of the two areas.

——	I.	II.	III.	IV.
SiO_2	72.33	62.54	61.93	67.76
Al_2O_3	12.99	14.79	13.03	14.00
Fe_2O_3	none	.....	.56	.....
FeO	2.50	8.49	8.00	5.18
MgO	.97	2.08	1.76	1.00
CaO	1.73	1.49	4.02	4.28
Na_2O	7.60	6.27	3.18	5.22
K_2O	none	1.12	2.80	1.19
H_2O	1.09	3.51	1.95	1.01
TiO_2	.74	.....	.84	.46
P_2O_5	.....	.....	.32	.19
MnO	.....	.....	.18	trace
CO_2	1.00	.....	.....	.....
S	.....	.....	.19	.....
	100.95	100.29	98.76	100.29

I. University mine dike, N. L. Bowen, analyst (Jr. Can. Min. Inst., Vol. XII.).
II. Lost Lake granophyre, Gowganda, N. L. Bowen, analyst.
III. Acid edge of nickel eruptive, Onaping section, Sudbury, E. G. R. Ardagh, analyst.
IV. Near acid edge of the Blezard-Whitson lake section. T. L. Walker, analyst.

The granophyre at Sudbury is the acid phase of the norite. On a following page are given analyses of the Sudbury norite and Nipissing diabase of Cobalt. These important ore-bearing rocks of the two areas are apparently of the same age, and are believed to be genetically connected.

BASIC DIKES YOUNGER THAN NIPISSING DIABASE

In the region one hundred miles in width, between Sudbury on the southwest and Quinze lake, which lies to the east of the head of Lake Temiskaming, on the northeast, basic dikes have been found at many points. These dikes are younger than the Sudbury norite and the Nipissing diabase, which, of the basic igneous rocks, immediately precede them in age.

The age relation of these dikes to those of aplite or granophyre, described on a preceding page, which are believed to represent acidic, residual material of the Nipissing diabase magma, is not known. The basic dikes in all probability also came from this magma. In the Sudbury area these dikes are cut by greyish, fine-grained granite, the youngest intrusive of that area.*

At Sudbury the basic dikes are composed of olivine diabase which on weathering shows the characteristic spheroidal forms. In thin sections under the microscope the rock is one of the most beautiful of its class. On the Quinze river, a hundred miles to the northeast of Sudbury, similar dikes of olivine diabase have been described by the writer.†

In the region between Sudbury and the Quinze many dikes of olivine diabase have been found as well as those of olivine-free diabase.

In the vicinity of Cobalt these dikes are rare, the only one studied by the writer being the basalt-diabase of Cross lake, described in following paragraphs.

The post-Nipissing diabase, basic dikes of the Elk Lake, Gowganda, Temagami and other areas, have been described by Messrs. Barlow, Burrows, Collins, and other investigators, references to whose writings are to be found in this report.

Later Basalt-Diabase of Cross Lake, Cobalt

About the middle of the southwest shore of Cross lake, the Nipissing diabase is cut by a dark colored dike. At the immediate contact the dike rock is very fine in grain and is a basalt. Farther away from the contact it passes into a diabase. The basaltic facies is made up of plagioclase, olivine and magnetite or ilmenite. The texture is porphyritic. The plagioclase phenocrysts occur in narrow rods showing carlsbad, albite and sometimes pericline twins. Zonal banding is seen. Few of the crystals happen to be cut exactly normal to the albite twinning lamellæ, so that the composition cannot be definitely determined, but the feldspar is probably labradorite. The plagioclase in the ground-mass occurs in smaller rods of the same composition (labradorite). A tendency to flow structure is noted in these small rods. Olivine occurs both as phenocrysts and in the ground-mass. It is found in grains showing common crystal faces and also in rounded individuals. There is considerable opaque material lying in the interstices of the plagioclase rods. It is probably magnetite (or ilmente); some of it shows dendritic forms.

The diabase facies contains labradorite, augite, biotite and magnetite (or ilmenite). The labradorite occurs in the usual rods embedded partly or wholly in augite. The latter is in allotriomorphic grains with a faint violet brown color indicating the presence of titanium. Some biotite is present and also much magnetite (or ilmenite).

This later basalt-diabase as exposed on Cross lake is finer in grain than the earlier Nipissing diabase of the Cobalt area. Owing to drift covering its areal distribution has not been determined.

The following table shows the chemical composition of the dike rock at Cross lake. For comparison the composition of the olivine diabase and norite of Sudbury, and the Nipissing diabase of Cobalt, is given.

*14th Report, Ontario Bureau of Mines, Part III., pp. 14, 126.
†11th Report, Ontario Bureau of Mines, pp. 227, 229.

Analyses

——	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
SiO_2	45.20	47.22	49.84	48.06	49.90
TiO_2	.....	3.62	.....	.....	1.47
Al_2O_3	19.08	16.52	18.94	18.23	16.32
Fe_2O_3	3.64	3.32	1.51	9.57	.....
FeO	14.64	12.40	6.40		13.54
CaO	7.89	9.61	10.32	11.55	6.58
MgO	4.98	3.33	7.39	7.80	6.22
BaO	.....	.01	.....	.....	.....
Na_2O	3.32	3.40	1.99	1.87	1.82
K_2O	1.08	.67	1.28	.27	2.25
MnO	.....	.04	.....	.....	trace
CuO	.....	trace	.....	.....	.....
NiO	.....	.0275	.....	.....	.....
CoO	.....	.0055	.....	.....	.....
P_2O_5	.....	.33	.....	.....	.17
H_2O	.....	.30	.....	.....	.76
Loss on ignition	.....	.....	2.57	3.54	.....
Total	99.83	100.803	100.24	100.89	99.03
Sp. Gravity	.....	3.01	.....	.....	.....

No. 1, Basalt-diabase dike, Cross lake, Cobalt. No. 2, Olivine diabase dike, Sudbury. No. 3, Nipissing diabase cut by basalt-diabase dike at Cross lake. No. 4, Nipissing diabase, on the Violet property near Cross lake. No. 5, Norite, more basic than the average, at Sudbury.*

*Analyses Nos. 2 and 5 are taken from Dr. A. P. Coleman's paper in the Fourteenth Report, Ontario Bureau of Mines, Part III.

Fig. 46a.—Good roads at Cobalt.

PALEOZOIC

Silurian Limestone

It will be seen from the map (scale 1 mile to the inch), that the Niagara and Clinton limestone forms some large outcrops on the islands and in the vicinity of the shore near the northwest corner of lake Temiskaming. This limestone affords stone suitable for building and for the production of lime, and on this account should be of considerable value in the years to come, since the rock is a somewhat rare material in most of this northern part of Ontario. The district to the west and north is being rapidly settled and will soon contain a large population which will need much material for building purposes. The following is an analysis of a sample of limestone taken from Farr's quarry, Haileybury:

Fig. 47.—Holy Cross Cathedral, Haileybury, built of Niagara limestone, quarried near the town.

	Per cent.
Insoluble residue	1.60
Ferric oxide and alumina	.66
Lime	29.50
Magnesia	21.59
Carbon dioxide	46.84
Sulphur trioxide	.70
	100.89

This limestone formation extends northward, although overlain by clay and similar deposits in many places, and has been observed by the writer along the south branch of the Blanche river below what is known as the Mountain portage.

Considerable attention has been paid to the limestone area, Sir William Logan having first described it years ago. It has been shown that the series here is more closely related to the Niagara of Southern Ontario than it is to the Niagara areas to the north and west.

The cobalt-silver deposits being of pre-Cambrian age, the Paleozoic limestone is of little interest in connection with the ores. It is of course possible that ore-bearing rocks underlie the limestone.

Fig. 48.—Contact of quartzite of the Cobalt series with Niagara limestone, on the east shore of Lake Temiskaming, north of Piché point. The fragments of quartzite are cemented together by limestone.

Along the wagon road, in lots 5 and 6 in the third concession of the township of Dymond, to the northwest of the town of New Liskeard, the limestone cliff presents a striking face, indicating faulting. The fault line is continuous with the western shore of lake Temiskaming, and furnishes still further evidence confirmatory of the theory that the lake lies along a great northwest-southeast fault.

Additional notes on the Silurian, taken from Dr. A. E. Barlow's valuable report, are given in appendix I, on a following page.*

*Geo. Sur. Can., Vol. X., 1897, p. 123 I. *See* also Geology of Canada, 1863, p. 134.

PLEISTOCENE

Glacial and Recent

Immediately preceding the Glacial period, doubtless the surface of what is now the productive cobalt-silver area was in a highly weathered or decomposed condition. The glaciers scraped off this loose material from the surface and carried it southward, intermingled with other material. In all probability much more ore was carried away by the ice sheet than has been mined. Nuggets or boulders of rich silver ore have been found in prospecting trenches at numerous points to the south of the mines. A glacial boulder, worth about five thousand dollars, now in the Bureau of Mines collection, is described on a preceding page.

Everywhere throughout the region the surfaces of the rocks give evidence of glacial action. The underlying loose deposits, on the surface of the glaciated rocks, consist typically of boulder clay. This is succeeded upward, north of Cobalt, by a considerable thickness of strikingly well laminated clay (Fig. 49). Above this clay,

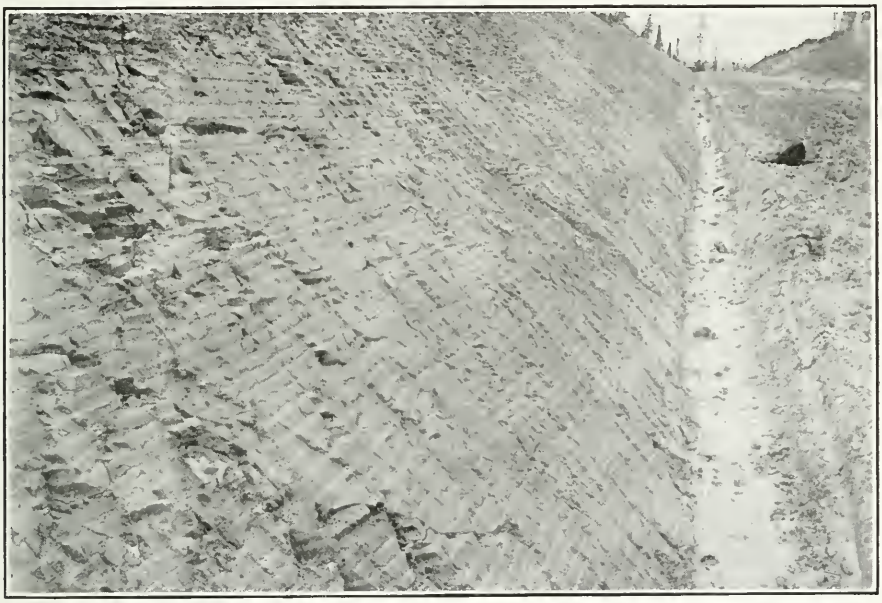

Fig. 49.—Bedded clay in railway cut between Haileybury and New Liskeard.

on some of the hills, to the north of lake Temiskaming, are sand and gravel deposits. The glacial deposits in this part of Ontario have been well described by Dr. A. P. Coleman.*

A couple of miles northward of Cobalt station the agricultural region of this part of northern Ontario is met with. The soil is essentially a well banded clay (Figs. 49, 50). Between this point and the height of land, or watershed, between the Hudson bay and Ottawa river waters, the clay does not form a continuous mantle, but there are large areas of tillable land which are being rapidly settled. Outcrops of solid rock, in many cases representing hill tops, which project through the clays, are seen. North of the height of land, however, is a large agricultural area, estimated at 16,000,000 acres, now traversed by the National Transcontinental Railway, and known as the "great clay belt," in which exposures of solid rock are few in number. The clay on both sides of the height of land is pretty uniform in character.

Following is an analysis of the clay in a cut on the railway between Haileybury and New Liskeard. It will be seen that the lime and magnesia are rather high. This

*Lake Ojibway; Last of the Great Glacial Lakes. Eighteenth Report, Ontario Bureau of Mines, p. 284 *et seq.*

is owing to alternate bands containing considerable marl. The clay effervesces strongly in acid.

	Per cent.
Silica	52.00
Alumina	16.11
Ferric oxide	4.69
Lime	8.26
Magnesia	4.10
Potash	1.74
Soda	2.76
Sulphur trioxide	.09
Loss on ignition	9.64
Total	99.39

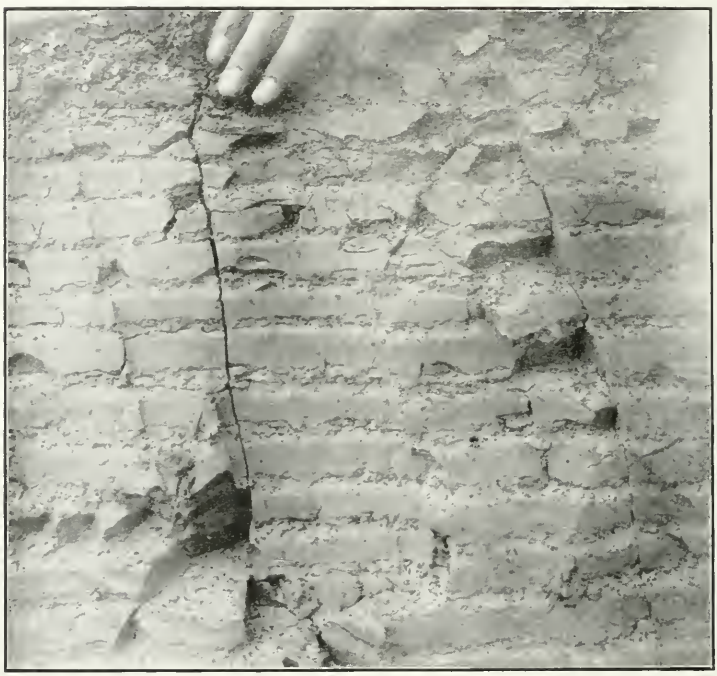

Fig. 50.—A part of the face of the cut shown in Fig. 49 enlarged.

Direction of Glacial Striae

The clay used in the manufacture of brick in the vicinity of New Liskeard is described by Mr. M. B. Baker in the 15th Report of the Bureau of Mines, Clay and the Clay Industry of Ontario, pages 83 and 84.

Concerning the glacial striæ on the rocks in the vicinity of lake Temiskaming Dr. A. E. Barlow says:*

"In the subjoined list, which is necessarily brief and incomplete, consisting of observations made during an exploration whose primary object was to map out and report upon the various subdivisions of the Archæan rocks, an attempt has been made wherever possible to tabulate in regard to their age the various striæ observed. Where two, three, or even four sets are noted as occurring on the same rock-surface, the order in which they appear is believed to represent, with approximate accuracy, their relative ages from the oldest to the most recent.

*Annual Report, Geol. Sur. Can., Vol X., 1897, p. 135 I.

List of Glacial Striae

"Wabis bay, west shore of, on lot 10, con. V, Bucke township	S. 15° E. S. 45° W.
Wabis bay, east shore of, on lot 2, con. I, Harris township	S. 19° E.
Sutton bay, northeast shore of, on lot 8 con. V, Harris township	S. 51° E.
East shore, west of Abbika creek, on lot 38, con. I, Guigues township	S. 81° E.
Chiefs island, east shore of	S. 36° E. S. 66° E.
Chiefs island, north shore of	S. 66° E.
Chiefs island, west shore of	S. 14° E. S. 48° E. S. 54° E.
East shore, on lot 31, con. I, Guigues township	S. 32° E.
Piché point, south of, on lot 12, con. I, Guigues township	S. 33° E. S. 46° E.
East shore, north of Wright's mine, on lot 7, con. II, Guigues township	S. 23° E. S. 43° E.
Wright's mine (Lake Temiskaming silver mine), on lot 62, con. I, Duhamel township, "Block A"	S. 21° E. S. 31° E. S. 60° E.
Joanne bay, east shore of, on lot 58, con. I, Duhamel township	S. 28° E. S. 14° W.
East shore, on lot 54, con. I, Duhamel township	S. 26° E. South
East shore, at Narrows with Bryson island, on lot 44, con. I, Duhamel Tp.	S. 21° E.
East shore, opposite Drunken island, on lot 31, con. I, Duhamel Tp.	S. 4° W.
West shore, on lot 14, con. IV, Lorrain township	S. 4° W.
West shore, on lot 12, con. VI, Lorrain township	S. 21° E.
West shore, on lot 11, con. VII, Lorrain township	S. 12° W. S. 18° W.
West shore, on lot 15, con. I, Bucke township	S. 18° E. S. 26° W.
Laperriere bay, north shore of, ½ a mile east of old H. B. Co.'s post, lot 7, con. II, Duhamel township	S. 21° E. S. 6° W.
Islet near east shore, about 1 mile southeast of Roche McLean	S. 17° W. S. 32° W.
Roche McLean, near west shore	S. 10° E.
West shore, opposite Roche McLean	S. 4° E.
West shore, 1½ miles north of Montreal river	S. 4° W.
West shore, 1½ miles south of Montreal river	S. 21° E. S. 19° W."

The determination of the direction in which the ice sheet moved is of economic interest, since veins may be found by tracing to the northward the source of certain boulders. Such a method of prospecting was employed with success some years ago by the writer in the corundum area of southeastern Ontario.*

*Seventh Report, Ontario Bureau of Mines, p. 222.

DENUDATION AND DEPOSITION

Erosion in the District

While the following notes repeat some of the statements on other pages, it is thought well to deal with these subjects by themselves, since denudation and deposition, especially the former, have such important economic bearings in connection with the ore deposits of the region.

The rocks furnish evidence that proves there have been several changes of level in the district. During vast periods the surface stood above the level of the sea, and extensive erosion took place. During others it was covered by the waters, and the deposition of sediment continued throughout great intervals of time.

The oldest rocks of the region are the Keewatin, described on preceding pages. In so far as can be determined, these rocks represent for the most part, submarine lava flows. It does not seem likely that in Keewatin times, there was no land surface on the globe, but, in so far as this region is concerned, little evidence has been found of the existence of such a surface. There may have been islands of comparatively small extent.

A great period appears to have elapsed after the extrusion of the Keewatin lavas under the waters of the primeval sea before the surface was elevated and extensive erosion began. During this period a thick series of sediments, the greater part of which may represent chemical precipitates, was laid down. None of these sediments are coarse in grain. Normally at the base, are found greywacké, whose component particles can, for the most part, be recognized only under the microscope. Above this comes impure slate or clay rock, often graphitic or containing considerable iron pyrites. In many parts of the region, iron formation or jaspilyte, interbanded silica and iron oxides, rests on the Keewatin, with a thin layer of greywacké frequently lying between the two, *e.g.*, near Temagami. Other sediments are represented by comparatively small outcrops of crystalline limestone. While the normal order of sedimentation appears to be greywacké, impure slate, iron formation and crystalline limestone, one or more of these may be absent when others are present.

The origin of the greywacké and impure slate cannot be definitely determined. Whether they represent land-derived sediments, or whether they come from volcanic fragmental material, connected with the submarine lava flows and more or less decomposed by sea water, is not known. That clays and coarser sediments are formed by the decomposition of rocks in sea water is well known.

"Passing over at present the organic deposits which form so characteristic a feature on the floor of the deeper and more open parts of the ocean, we come to certain red and grey clays found at depths of more than 2,000 fathoms, down to the bottom of the deepest abysses. These, by far the most widespread of oceanic deposits, consist of exceedingly fine clay, colored sometimes red by oxide of iron, sometimes of a chocolate tint from manganese oxide, with grains of augite, feldspar, and other volcanic minerals, pieces of palagonite and pumice, nodules of peroxide of manganese and other mineral substances. . . . These clays result from the decomposition of pumice and fine volcanic dust transported from volcanic islands into mid-ocean, or from the accumulation of the detritus of submarine eruptions."*

"The study of the dredgings has inclined the students of these materials to the conclusion that volcanic materials, rather than shells, are the principal source of the red clay."†

Little is known of the character of the products formed by the decomposition, under water, of the surface of submarine lavas. But it seems not unlikely that a relatively thin layer of impure clay or greywacké, resembling somewhat that found in certain localities on the surface of the Keewatin, may be thus formed. Knowledge of

*Geikie, Text-Book of Geology, Fourth Edition, p. 583.
†Chamberlin and Salisbury, Geology, Vol. 1., p. 366.

deep sea deposits is limited to thin superficial layers. Soundings do not usually penetrate more than a few inches, or at most a foot or two, and the character of the weathered surface of the underlying rock is not known.

These sediments, that now occur in isolated areas on the surface of the Keewatin throughout northern Ontario, are in some respects unique when compared with those deposited in Paleozoic and later times. Jaspilyte has been found on most of the continents in association with the oldest rocks, but has no parallel among those of later age. In all probability these ancient sediments had a much greater thickness than is now apparent and formed a practically continuous covering on the Keewatin. Erosion has removed the greater part of them; the outcrops left represent remnants that have been preserved in depressions in the Keewatin, formed by folding, or through faulting or other means.

The group of sediments is similar to that of southeastern Ontario, to which the name Grenville is applied, and which has been estimated to have a thickness of thousands of feet.

It is not unlikely that these rocks in northern Ontario had a similar thickness, but they have been subjected to more intense erosion than have those of the southeastern part of the Province.

Intruding both the Keewatin and the overlying Grenville sediments are the Laurentian granite and gneiss. The intrusion of the Laurentian was probably connected with mountain building, the Keewatin and Grenville rocks being raised above the waters.

The First Great Period of Erosion

After the intrusion of the Laurentian, the rocks were subjected to a great period of erosion, and the conglomerate, greywacké, quartzite and other sediments, known as the Temiskaming series, were deposited as the land surface was gradually depressed.

It is impossible to say what was the thickness of the Temiskaming series. It has been deeply eroded, and only remnants of it are found throughout the region surrounding Cobalt. Mr. J. G. McMillan, from a study of exposures of the rocks in Midlothian township, north of Gowganda, is of opinion that in that area the thickness is approximately 7,000 feet.

Lorrain Granite Intrusion and Second Period of Erosion

The Temiskaming series is penetrated by at least one group of eruptives, *e.g.*, lamprophyre dikes, older than the Lorrain granite. Probably contemporaneously with the intrusion of the latter rock, the region was subjected to great disturbance and the Temiskaming series and older rocks were intensely folded, or in other words there was a second period of mountain building.

After this began another great period of erosion, during which vast quantities of material were removed from the surface. The products of this erosion are now represented by conglomerate, greywacké, and other rocks of the Cobalt series. At the end of this erosion the folded Temiskaming series was completely worn off the surface over a great part of the region, and only isolated outcrops of it were left. The Cobalt sediments rest in one place on the Keewatin, and at another on the Lorrain granite or on the Temiskaming series, illustrating the deep erosion that gave rise to them.

Nipissing Diabase Intrusion and Third Period of Erosion

After the Cobalt sediments had become compact and hardened, the intrusion of the Nipissing diabase took place. Succeeding this intrusion the region was again subjected to prolonged erosion before subsiding beneath the waters. If, as suggested elsewhere in this report, the Nipissing diabase is of Keweenawan age, a fairly close estimate can be made of the length of this period of erosion, since Silurian rocks, Clinton and Niagara, were the next to be deposited.

The Ordovician period, and probably part of the end of the pre-Cambrian, is unrepresented by rocks in the region. During this period thick deposits of sediments

were being formed in the southern part of the Province, along what are now the shores of lakes Ontario and Erie, and to the north on what is now the James Bay slope. Sediments representing series of rocks that are absent in the region surrounding Cobalt may have been deposited and afterwards removed by erosion.

Erosion Since the Niagara Period (Fourth Period of Erosion)

During the almost inconceivable time that has elapsed since the deposition of the Niagara rocks, the region has been subjected to intense erosion.

From the fact that Paleozoic rocks younger than the Niagara are found in both the more northern and southern parts of the Province, it is possible that such rocks were deposited in the region under review. If this was the case, the material has been completely removed by erosion, no trace of its presence remaining.

Depth of Erosion

The depth to which erosion reached in each of the four periods of denudation, to which reference has been made, and the quantity of material removed from the surface cannot be determined. That in each of these periods a great thickness of rock was worn off the surface is evident not only from the deposits resulting from the erosion, the Temiskaming and Cobalt series, but also from observations that have been made in certain parts of eastern North America and elsewhere, in localities where the depth of erosion during certain periods can be somewhat definitely determined.

Referring to the erosion of the gold-bearing rocks of Nova Scotia, Mr. E. R. Faribault says: "Extensive denudation has worn away the folded measures to the present level. Some of the sharpest and highest folds have been truncated to a depth, as far as known, of over eight miles, exposing at the surface a section of gold measures over five miles in thickness."*

From recent studies in Central Pennsylvania, R. T. Chamberlin has shown that a thickness of at least between three and four miles has been eroded since later Paleozoic times.**

According to Dana and other writers the Appalachians have lost by denudation much more material than they now contain. Faults, in which one side was left standing 10,000 feet or more above the other, have been so levelled off that there is no evidence of the fault in the surface features of the country.†

In South Africa it has been found that over ten thousand feet of rock were removed during one comparatively short period, the interval between the Jura-Trias. Since erosion to this extent has taken place in such an interval, how vast must be the erosion on surfaces, such as those of northern Ontario, that have been exposed throughout a large part of geological time!

Climate in Past Ages

The sedimentary rocks furnish evidence of changes in climate in the region. The older sedimentary material, especially iron formation and crystalline limestone, which is believed to represent the Grenville series of southeastern Ontario and to have had a great thickness, indicates a warm or at least a comparatively mild climate. Thick deposits of limestone would not be formed in cold water.

The character of the sediments of the Temiskaming series also do not indicate a cold climate. On the whole, those of the Cobalt series indicate a climate, probably not greatly unlike that of the present; although there is considered to be evidence of the deposition of some of these rocks by ice action.

The limestones of Clinton and Niagara age show that at that time the climate was mild.

*Jour. Can. Min. Inst., Vol. II., 1899, p. 121.
**Journal of Geology, Vol. XVIII., 1910, pp. 242-3.
†Dana, Manual of Geology, 3rd Edition, p. 653.
‡The Geology of Cape Colony, Rogers and Du Toit, p. 443.

The record, from the time of the deposition of these limestones to the Pleistocene ice age, is lacking, owing to the surface having been exposed above the sea for much the greater part at least of the vast interval, during which it has been subjected to denudation.

Economic Effects of Erosion

In so far as concerns the cobalt-silver deposits, only two of the four great periods of erosion described need be considered. Doubtless, however, vast quantities of other mineral deposits of economic value were removed by erosion in the two earlier periods. There is evidence, for instance, that iron formation was present on a large scale before the earliest period of erosion. Many deposits that might have become great iron mines were in all likelihood removed. Then the Porcupine and other gold deposits of the region appear to be genetically connected with the Lorrain granite. This rock, as well as the older series of the district, was deeply eroded during the time that the sediments of the Cobalt series were being deposited. Hence the gold veins have doubtless had much of their upper parts cut off. It may be noted that the ores now found in the veins give evidence of a deep-seated origin. Deposits of chalcopyrite, pyrite and galena, now of small extent in the district, suffered like those of iron and gold.

All of the mineral deposits mentioned have of course been subjected to erosion during the last two periods, viz., that between the pre-Cambrian and Niagara, and that of great duration between the Paleozoic and the present time.

While the cobalt-silver deposits are later in age than the two earlier periods of erosion, they or the rocks in which they occur, have been exposed to the effects of denudation during the greater part of the later two periods. Probably these veins or deposits did not extend to the surface, as it existed at the time they were formed. Erosion has, however, removed the rocks that lay above, or in which certain veins or parts of veins were enclosed, and great quantities of ore have been removed. There is evidence of this even in the boulders of rich ore that have been found in glacial deposits to the south of the productive area (see page 32).

While the rocks in which the veins are found were subjected to erosion during part of the time that elapsed between the pre-Cambrian and Niagara, they were protected for a time by submergence and a covering of Paleozoic rocks until these were removed in the vast period of erosion that has followed the Niagara.

REGIONAL DISTURBANCES

From the geological maps and the plan, showing the distribution of the veins at Cobalt, which accompany this report, it will be seen that while the belts of the fragmentary rocks strike approximately northeast and southwest, as for example the belt along the railway at Cobalt and the Glen and Kerr lake belt, the majority of the veins have a strike different from this. It would also appear that the strike of the veins in this area has little connection with the disturbance or disturbances which caused the great majority of the larger rivers and chains of lakes in the district to follow one or other of two well defined directions.

A glance at a general map, such as the "Map of Part of the District of Nipissing," published by the Department of Lands and Mines of Ontario, will convince the reader that the system of water courses in the district is a truly remarkable one (Fig. 51). The Nipissing and Temiskaming map sheets published by the Geological Survey, Ottawa, show the system to hold over a still larger district. The chief water courses, as the maps show, follow either a northeast and southwest, or a northwest and southeast direction. While both of these courses are indicated clearly on the maps, the latter is the more prominent.

N.W.—S.E. Water System

The Temiskaming and Northern Ontario Railway from lake Temiskaming to North Bay junction, on the main line of the Canadian Pacific Railway, has naturally been constructed along the line of least resistance, or in other words, it has been built for the most part along a line of depression in order to avoid costly rock cuts. The map shows that this road practically parallels, running in a northwesterly direction, the Ottawa river and lake Temiskaming for the first 90 miles or more of its course, to the crossing of the Montreal river at Latchford station, the railway being 15 or 20 miles to the westward of the Ottawa. At Latchford the railway turns northeastward and runs for 12 or 14 miles, parallel with the second great system of water courses, to Haileybury on lake Temiskaming. The direction followed by the railway for the first 90 miles of its course proves that there is a line of depression here, parallel with the Ottawa river and lake Temiskaming, although it is not indicated by water courses on the map along the greater part of the route.

Continuing northwestward from Wabi bay, the northwest corner of lake Temiskaming, and in line with the direction followed by the main body of this lake and the Ottawa river for about 75 miles, there is a water course, Wabi creek, which flows southeast for about 15 miles. In line northwestward from this point on Wabi creek the map of Nipissing does not show any prominent water course in a direction northwest and southeast for about 15 miles, although two branches of the Blanche river cross this space on the map in a direction northeast and southwest, parallel with the other great system of water courses. Fifteen miles in line northwestward of that part of Wabi creek referred to, the lake Temiskaming-Ottawa river line is continued northwestward by what is here known as the south branch of the Blanche river. For 15 miles northwestward here the river is represented by lake expanses, Long and Kinogami lakes, and for 15 miles above the upper of these lakes the river is ascended in a northwest direction to the limits of the map of Nipissing, to which reference has been made.

The length of the line followed northwestward from Mattawa by the series of water courses mentioned—Ottawa river, lake Temiskaming, Wabi creek, Long and Kinogami lakes and the upper part of the south branch of the Blanche river—is approximately 135 miles.

It will be seen, however, that there is a bend in lake Temiskaming near the point where the Montreal river enters it. The lower part of the lake and Ottawa river are therefore more in line with the Montreal river than with Wabi creek.

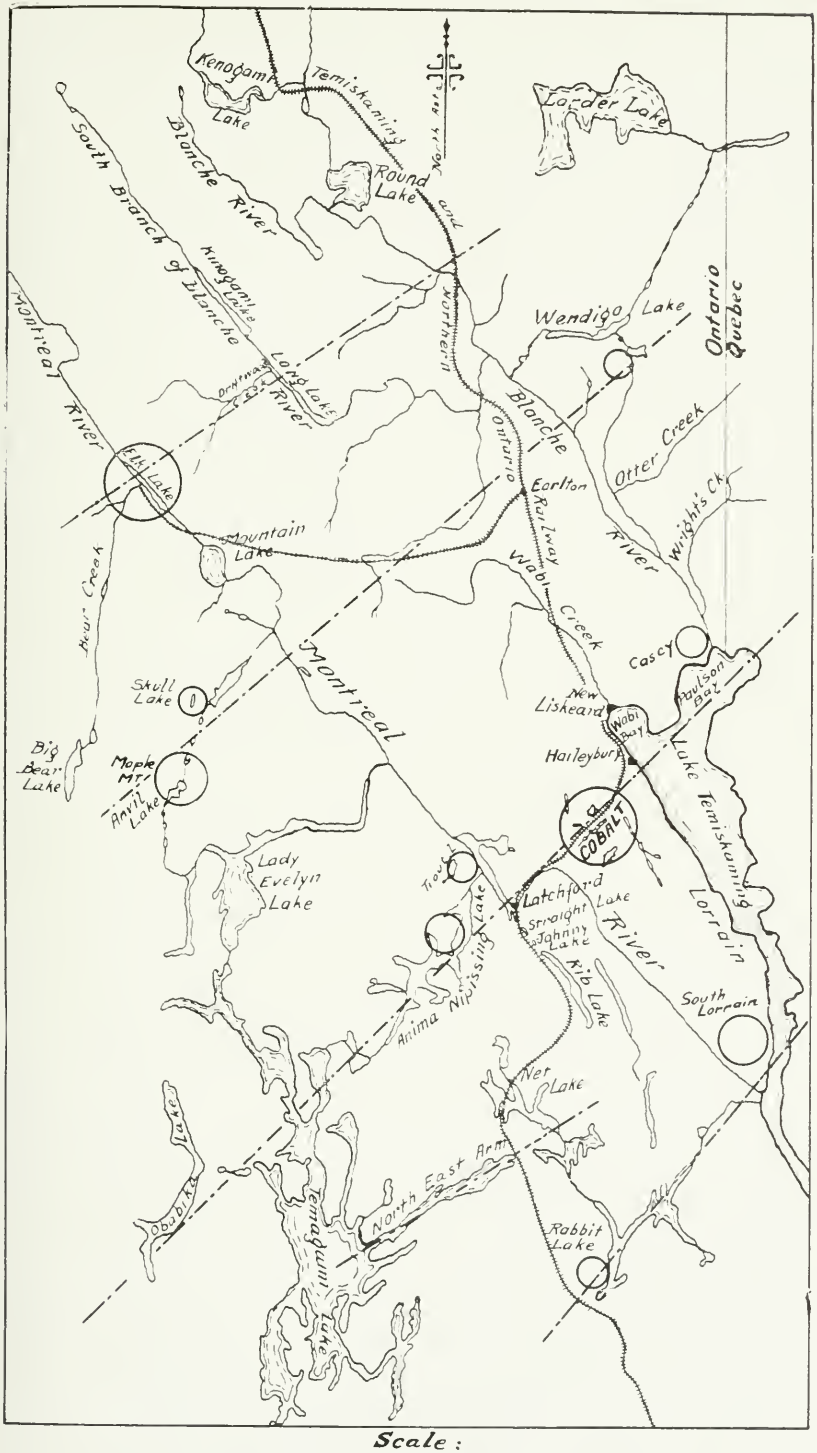

Fig. 51.—Relations of N.E.—S.W. Lines of Regional Disturbance to the Cobalt-Silver Deposits. Rabbit Lake—South Lorrain; Anima-Nipissing—Cobalt; Anvil Lake—Wendigo Lake.

The Blanche river enters the northeastern expansion of lake Temiskaming and the main stream and Round lake branch of this river follow a northwest line for a distance of 35 or 40 miles. This northwest axis of the Blanche lies parallel with the Wabi creek-lake Temiskaming axis, and 9 or 10 miles to the northeast of it.

A third water course which shows a striking parallelism to the two described is that of the Montreal river, which lies 10 or 11 miles southwest of the northwest axis of the Ottawa river. From the railway crossing at Latchford station northwestward through Bay lake and the townships of Auld, Barber, James, to the edge of the Nipissing map, the line of the river holds its northwestward course for over 50 miles. Southeastward from Latchford station the line of weakness, if we can so call it, is continued through Straight, Johnny and Rib lakes for 9 or 10 miles. It will be seen that in the township of Barber and immediately below Latchford station, for example, the river changes its course for 3 or 4 miles, here following the direction of the other great system of water courses, that is the northeast and southwest one, but it gets back again into its normal northwest and southeast course.

Immediately east of the cobalt-silver area there is a chain of small lakes—Cross, Kirk, Chown and Goodwin—with connecting streams, which follows a clearly defined northwest and southeast direction, parallel with the shore of Temiskaming, distant 3 miles to the eastward.

N.E.—S.W. System

The water courses and lake axes which lie in a northeast and southwest line are not so prominent on the maps as are the northwest-southeast ones just described; still they form a not indistinct system, and, as indicated by Fig. 51, they seem to have an important, but as yet little understood, relationship to the cobalt deposits of not only Cobalt proper, but of those of Rabbit lake 30 miles to the south, Casey township 15 miles to the northeast, South Lorrain to the southeast, and others. If a line be drawn on the map from near the mouth of the Quinze river, at the northeast extremity of lake Temiskaming, southwestward to Latchford station on the Montreal river, a distance of 22 or 23 miles, and beyond, it will be seen that it follows the main axis of the large northeast bay of lake Temiskaming, and that the longer axis of Cobalt lake lies parallel to it. Several other small lakes—Short, Pickerel and Bass—lie approximately on this line, as does also that part of the Montreal river between Latchford station and Gillies. Farther southward it will be seen that one long narrow arm of lake Temagami and adjacent bodies of water follow a northeast and southwest line for over 20 miles. Rabbit lake, east of Temagami, has one arm 5 or 6 miles in length running in the same direction and another whose axis follows a northwest-southeast line. The two arms of Obabika lake, to the west of Temagami, show a similar relationship, one to the other.

The most striking water course following a northeast-southwest line is, however, the northeast or what is sometimes called the Abitibi branch of the Blanche river. There is a string of eleven lakes here between Wendigo lake, north of the township of Ingram, and the Quebec boundary, a distance of 15 miles. To the southwestward in the townships of Armstrong and Henwood the south branch of the Blanche follows about the same direction. Otter and Wright creeks, which run from the Quebec boundary into the Blanche river, between the head of Temiskaming and Tomstown, flow in a southwest direction.

The plan, Fig. 51, shows that the three occurrences of cobalt ores, viz.: at Cobalt, in Casey township, and those at Anima-Nipissing, are on or near one northeast-southwest line. The occurrence at Rabbit lake and in the township of South Lorrain are on a similar line. Further, the deposits at Anvil lake or Maple mountain are approximately in line with those at Wendigo. Believing that the occurrence of ore is in some way connected with the northeast-southwest lines of weakness the writer advised prospectors to search for deposits in the vicinity of Animanipissing. This resulted in the first finds of cobalt there.

At points where the two systems of water courses join a number of striking V-like turns are shown in lakes and rivers, as for example, those formed by (1) the two arms of Rabbit lake, (2) the northeast arm of Temagami with the main body of the lake, (3) the turns in the Montreal river at Latchford station and at the Sandy portage, (4) the longer axis of Wabi bay with that of Paulson's bay at the head of lake Temiskaming. The angles thus formed appear to be slightly less than a right angle and the V in all but one of the cases mentioned points southward. The axes of the two arms of Obabika lake form an angle greater than a right angle, which points eastward.

Considering the great variety of rocks cut through by the water courses of the two systems, the regularity of the courses over such a large district is remarkable. A few lakes and streams have their longer axis lying in a north and south or in an east and west direction, but they do not form a system comparable to either of the other two.

Origin of the Systems

The preceding notes on regional disturbances were published in the first edition of this report, written in 1904, and in subsequent editions. It may also be well to republish here the following two paragraphs in which predictions, that have now been verified, were made that certain structures are due to faults. As shown, on other pages in this edition of the report, and on the geological sections (Plates I-VI) that accompany it, underground work in the mines has now proved that a fault follows the longer axis of Cobalt lake and extends beyond it. The Niagara limestone in the township of Dymond furnishes verification of the statement that a northwest-southeast fault follows the longer axis of lake Temiskaming.*

"Concerning the origin of the two great systems of water courses little can be said at present. It is impossible to say whether the courses follow fault lines or simply folds. They are doubtless due to regional disturbance in post-Nipissing diabase times. Much of the surface of the country is covered by recent and glacial deposits, and the rocks where exposed present such a complex of igneous and metamorphosed fragmental material, with minor faults and folds, that it will be difficult to prove the existence of what may be called regional faults or folds. It can be proved that slight faulting, at least, has taken place in post-Glacial times.

"At Cobalt lake, which has its longer axis parallel with one of these regional axes, if we may so call them, the beds of the greywacké-slate and conglomerate of the Cobalt series dip towards the lake, as shown at the veins on the Coniagas property and on Cobalt hill, on the Nipissing, location R L 404. The lake, judging from the dip of these rocks, occupies the axis of a syncline. The hills where the dip was observed lie at an elevation, on both locations, of about 100 feet above the railway track at Cobalt station. At the powder house vein, however, on the La Rose, near the foot of Cobalt lake, the slate is seen to be practically horizontal. The vein here referred to is at the base of a cliff, which rises to a height similar to that of the hills across the railway track to the westward on the southern part of R L 400. In the former case, the hill is composed entirely of the greywacké-slate, while on R L 400 the rock is conglomerate of the same series. It would thus appear that the railway here follows approximately a line of fault. . . . . There may thus be a fault here parallel with the main axis of the synclinal fold and Cobalt lake. The strike of the main vein of the La Rose mine, J S 14, near the foot of Cobalt lake and that of the McKinley-Darragh vein at the head of the lake are approximately parallel with the main axis of the lake." . . .

Age and Character of Faults

Faults, with throw of a few feet at most, and joints are numerous in the rocks in which the ores are found at Cobalt. Fig. 12 of a part of the Cobalt vein, one of the first four found in the area, near the shore of Cobalt lake on the Nipissing property, illustrates the character of the faults with small displacement. Many faults were

*Eng. and Min. Journal, Sept. 30, 1911, p. 645.

found in working the main vein on La Rose property. Most of the small faults, like those of the greater one through Cobalt lake, are of the reverse class, the fault plane in the small ones being nearly horizontal.

In the mines few drifts are run that, for a part of their course at least, have not one smooth wall indicating a fault or a joint.

Even the fragmental rocks, as explained in the description of the Cobalt greywacké on another page, frequently possess a columnar structure. The veins often branch, forming stringers that run around the columns.

Faults of various ages are to be seen. At Cobalt certain faults in the Keewatin are older than the Cobalt series of conglomerate and greywacké, and may antedate the intrusion of the Lorrain granite. Others were doubtless produced at the time this intrusion took place. Faulting also likely occurred at the time of the eruption of the Nipissing diabase.

It is interesting to learn from the valuable, recently published report of Dr. A. C. Lane on the Keweenawan of Michigan, distant four hundred miles or more to the west of Cobalt, that regional disturbances of post-Niagara age also affected the rocks of that state which in many respects resemble those of Cobalt.*

A fault like that through Cobalt lake is younger than any of the pre-Cambrian rocks of the area, and may be even of post-Niagara age (Plate V). The northwest-southeast fault that is believed to run approximately parallel to the west shore of lake Temiskaming appears to be later than the Niagara limestone, since a strong fault is seen in this rock to the northwest in the township of Dymond, being apparently a northwestern part of the lake Temiskaming fault. Movements may have recurred along a great line of this kind during a vast interval of time. Veins formed during earlier movements might be reopened during later ones, and there would be a tendency to form parallel fissures.

Economic Bearing of Faults

The production of cobalt-silver ores has come from what may be called the upper rocks of the pre-Cambrian, or those which are in close association with the diabase sill, in distinction from those which lie at a depth below the sill. In an area which has been subjected to such intense erosion as has Cobalt, it is not remarkable to find that, in many places, the pre-Cambrian rocks that overlay the sill, or formed its hanging wall, together with the sill itself and a considerable thickness of its lower wall, have been removed. Under such conditions of erosion it is but to be expected that the upthrow sides of faults, or those that stood at a considerable elevation above the downthrow side after the dislocation had taken place, should have suffered the most. In the process of base levelling the upthrow side has in many cases been worn down to the level of the downthrow side. The result has been that the ore-bearing rocks, the diabase sill with the rocks on its upper wall and those for some distance below it, have been completely removed, exposing rocks that lay a considerable distance below the sill.

In the case of the downthrow side of faults the opposite effect has been produced, and a protective influence has been exerted on the ore-bearing rocks. Along the west, or downthrow, side of the fault that extends through Cobalt lake the rocks of the Cobalt series, that formed the foot wall of the diabase sill, have a much greater thickness than have the rocks of this series on the opposite side of the fault line. This has resulted in the preservation of parts of rich veins, on the downthrow side, which have added much to the value of the Cobalt Lake and McKinley-Darragh mines, whose workings are under the lake.

Faulting also appears to have an important economic bearing in considering the practical absence of rich cobalt-silver deposits on the Quebec or eastern shore of lake Temiskaming as contrasted with the abundance of these ores on the Ontario side of the lake, which here forms the boundary between the two provinces. The quartz-

*The Keweenaw Series of Michigan, Mich. Geol. Survey, 1911.

diabase, so characteristic of the Ontario mining area, is practically absent on the Quebec side of the lake. Moreover, the rocks that occur in greatest volume on the Quebec side are those which are older than the Cobalt series, viz.: Lorrain granite and Keewatin, although there are exposures of Lorrain arkose and quartzite. These last mentioned rocks, where they rest on granite, may be contemporaneous with the lower part of the Cobalt series.

From what has been said in the preceding paragraph it would appear that the Quebec side of the lake represents the upthrow side of a great fault, and that in the process of base levelling the ore-bearing rocks, the diabase sill with the rocks on its upper and lower walls, have been destroyed by erosion.

The numerous minor faults that have been studied in the Cobalt area are practically all of the reverse type, as is also the larger fault which traverses the rocks below Cobalt lake. Hence the fault that followed the line, now represented approximately by the western shore of lake Temiskaming, may be of the same character. Otherwise strata in the face of the cliff of Niagara limestone, in the township of Dymond, which dip to the east, represent normal faulting and do not agree with the theory that the Quebec side of the lake is on the upthrown side of the fault.

The character of the faulting in the region is, however, somewhat complex, but judging from what have been called the lines of weakness, or the direction in which lie the longer axes of the lakes and the course followed by the rivers, and from the direction of the known fault lines, the faults are in a direction either northwest-southeast or northeast-southwest. This would bring about the formation of great blocks, as illustrated in the accompanying diagram (Fig. 51).

The northwest-southeast faults appear to be of greater magnitude than those following a northeast-southwest course. It is not known whether the two fault systems are of the same or of different ages. Probably they are of similar age, and recurrent movements have taken places along both systems.

THE COBALT-SILVER VEINS

The relations of the veins to the rocks of the Cobalt area are illustrated in the colored cross-section, "Ideal Restoration of Rocks and Veins at Cobalt" (Plate IV), that accompanies this report. They are also shown in Fig. 7, page 5.

The distribution in the area of the important veins that had been discovered up to 1907 is to be seen on the geological map, scale 400 feet to 1 inch, that accompanied the third edition of this report. The uncolored map, scale 800 feet to 1 inch, of a part of the area shows the veins that were known up to a year ago. Two or three important veins, notably one under Cart Lake, have been discovered since that time.

The minerals found in the veins, and their age relations, are described on preceding pages.

Fissures and Joints

"It is not always possible, in a shattered rock, to discriminate between joints and those lines of division to which the term fissure is more usually restricted. Many so-called fissures may be merely enlarged joints."* This holds true in the cobalt-silver area.

Fig. 52.—A typical silver-cobalt vein, outcrop on the Coniagas. The head of the hammer shows the width.

While the openings occupied by some veins, or parts of veins, can be called fissures, there are many more to which the writer is inclined to apply the term joint. The openings in the greywacké and conglomerate are in many cases connected with columnar jointing in these rocks. A vein may occupy a distinct fissure-like opening for some distance, then it may split up, the stringers thus formed running around columns out of the former course of the vein and coming back some feet ahead into the line first followed. The columnar jointing is well shown in the rock cut along the railway a short distance south of Cobalt station. Several of the trenches, 20 feet or more in depth, from which ore has been extracted, illustrate the same phenomenon.

The dip of the great majority of the veins is vertical. As shown by the maps, there is no uniformity in the strike.

*Geikie, Text Book of Geology, p. 688.

Relation of Wall Rock to Ore

The productive veins, as the maps and cross-sections show, are found in three series of rocks, viz.: the conglomerate and other sediments of the Cobalt series, the Nipissing diabase sill, and the Keewatin complex. But eighty per cent or more of the ore has come from the Cobalt series. The chief reason for this greater productiveness is due to the fact that these rocks fractured more readily than did the diabase or the Keewatin.

There appears to have been no difference in the precipitation of ores due to physical-chemical influences of the country rocks. Precipitation seems to have taken place as readily in rocks of any one of the three series mentioned in the preceding paragraph as in the others.

Judging from the way in which silver is found in the minutest cracks in granite boulders of some of the conglomerate near the veins, this ore, at least, was precipitated no less readily in acidic rocks than in basic ones. With the exception of these boulders, there are few opportunities afforded of observing the relations of the ore to granite. But in the Temiskaming mine, a few hundred feet below the surface, narrow dikes of Lorrain granite intrude the Keewatin and are cut across by the vein. The surface of the granite is plated with native silver.

The occurrence of rich silver ore depends on the character of the openings in the rocks now occupied by the veins, on whether the veins have been affected by secondary disturbances, and on the proximity of the openings to the diabase sill. Naturally it would be expected that solutions would work upward through the openings in the hanging wall above the sill more readily than downward into the foot wall. Unfortunately owing to the excessive erosion to which the district has been subjected, there is little of the hanging wall of the sill left in the productive area at Cobalt. But of the veins thus far worked the two or three that occur in the hanging wall are productive to the greatest depth reached in the area.

In the foot wall of the sill, or what was the foot wall before erosion took place, the rich or merchantable ore is limited as to the depth to which it extends. This depth below the sill is variable, depending on the character and strength of the fissures. Rich ore descends to a less depth in narrow, more irregular fissures than in wide ones.

As has been said previously, much the greater part of the ore has come from veins in the fragmental rocks of the Cobalt series in the foot wall of the sill. These veins, on reaching the contact of the Cobalt series with the underlying Keewatin, either end at the contact, or split into stringers, or continue down into the Keewatin. In many cases the rich ore disappears when the veins penetrate the Keewatin. On the other hand, a few veins in stronger fissures have been found to be productive in the Keewatin, that, before erosion, lay beneath the sill.

The diabase sill, like the Keewatin, has thus far been found to contain but few rich veins in the Cobalt area. In the veins both in the diabase and Keewatin rocks, ore is found to occur more irregularly distributed than in those of the Cobalt series. In other words, it tends to occur in bunches.

The best veins that have been worked in the diabase are one on the Kerr Lake property and one on the O'Brien. Of those in the foot wall of the sill the best vein in the Keewatin has been No. 26 on the Nipissing. The veins on the Temiskaming and Beaver properties are in the Keewatin of the hanging wall of the sill, and descend into the sill itself.

Secondary Disturbance of Veins

In the case of a vein which passes from the Cobalt series into the Keewatin and carries high silver values in the former and not in the latter, the variation in values is to be accounted for by the fact that there have been two periods of deposition of the ore minerals. The first minerals to be deposited after the cracks were formed were essentially the cobalt-nickel arsenides. After these minerals were deposited there was a slight disturbance of the rocks, and the veins were slightly fractured and opened, giving an opportunity for the deposition of the silver minerals which were then per-

colating through the rocks. The Cobalt conglomerate and slate-like greywacké, being not highly metamorphosed and lying on the Keewatin or in contact with the diabase, were affected by the secondary disturbance, while the great mass of tough Keewatin rock for the most part escaped the disturbance and the veins in it were not fractured so as to give access to the silver solutions. Where Keewatin veins lay near a diabase contact they were not only in a better position to be affected by the secondary disturbance, but they were also nearer the source of the solutions which appear to have come from the diabase magma.

Dimensions of the Veins

In width the more characteristic veins probably average about four inches. One of the first veins to be worked, the Trethewey, had a maximum width of about eight inches. Another of the earlier discovered veins, that on the hill near the shore of Cobalt lake

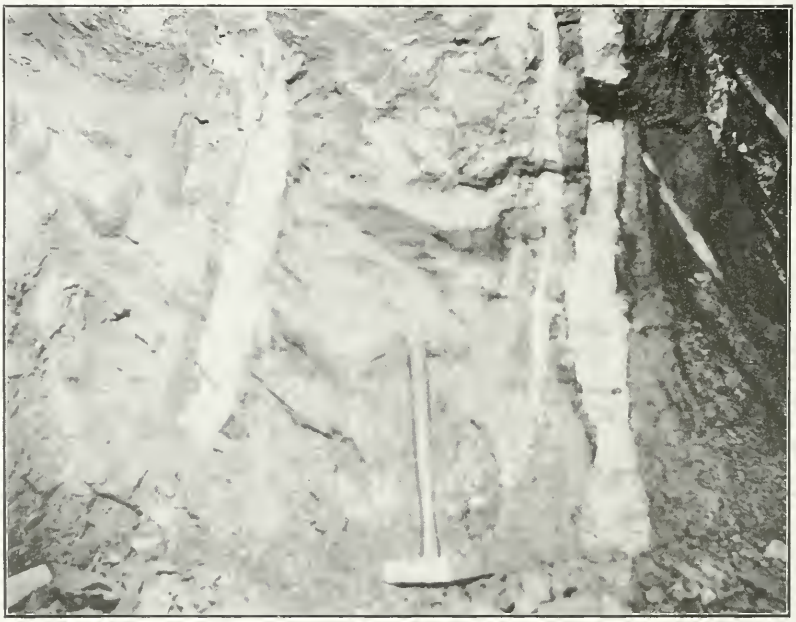

Fig. 53.—An underground view in La Rose, showing parallel veins.

on the Nipissing property, had a width of fourteen inches, but it was not of economic importance as a source of silver. An analysis of the ore is given on page 17. The first level on the main LaRose vein followed what may be called more properly a system of veins, three or four roughly parallel veins being at times exposed in the level (Fig. 53). Numerous, small, nearly horizontal faults were found in the veins, which were frequently thrown beyond the face of the level. Where the whole vein system was exposed, the total width of ore averaged slightly over one foot. The length of La Rose main vein with its continuation on the Right of Way property is about 1,000 feet. One of the side or cross veins, No. 3, on LaRose has a length of about 900 foot.

Usually the veins are much shorter. Certain veins that average not more than an inch in width have a length of one hundred feet or more.

The complex character of the veins on some of the properties is shown in the plans published in the annual reports of certain of the mining companies, e.g. the Coniagas, where wide stopes are worked which include several narrow veins with frequently varying strikes.

The depth of the veins, or the productive parts of them, is variable, depending on

whether they continue downward in one class of rock or encounter rocks of different classes, on the strength of the fissures, and on the distance of the ore bodies, in the Cobalt series and the Keewatin, from the diabase sill.

One of the first veins to be worked had a depth, at the point where the shaft was sunk, of sixty feet in the Cobalt series and came to an end when the Keewatin was reached. Other veins have been worked to a depth of two hundred feet or more in good ore, but most of them are productive to lesser depths.

Even in the Cobalt series, where the thickness is greater than usual, the rich ore in certain cases has been found to disappear before the underlying rocks are reached.

As has already been said, the veins that have been found to be productive to the greatest depth lie in the hanging wall of the diabase sill. Little of this wall is left at Cobalt, most of it having been removed by erosion, and the great majority of the veins are in the foot wall, a few being in the sill itself.

Former Vertical Extension of Veins

Certain writers have expressed the opinion that veins of the Cobalt area, that outcrop at the surface or occur immediately below the drift covering, represent the narrower, lower parts of wider veins that extended to or towards the original surface. There is no justification for the holding of such an opinion. The few veins that have been worked to a depth of a few hundred feet in rock of one series give no indication of becoming narrower below, althougth, when the veins are in the foot wall of the sill, the ore tends to become less rich, as the vertical distance below the sill or the eroded part of it becomes greater. Moreover, "blind" veins, or those which do not reach the present surface of the rock, have been found. These veins have the same character, as regards width and mineral content, as those which are exposed at the surface.

Briefly, it appears that after the intrusion of the diabase, fissures and cracks were formed in the rocks of the hanging wall and in those of its foot wall, and in the sill itself. The openings in the upper wall probably extended a considerable distance upward beyond the sill, but there is no evidence that they reached the surface or that they were wider in the parts that have been eroded.

As already said, some of these fissures in the upper wall extended downward into the sill itself, e.g., veins on the Temiskaming, Beaver, and Nova Scotia.

Then there are veins, e.g., that on the Cobalt Central property, which have been worked at the surface in the diabase and followed downward into conglomerate and greywacké which at times lie beneath the sill.

Again blind veins are found in the Cobalt series and in the Keewatin where the sill has been eroded.

There are also blind veins, e.g., one that was worked two or three years ago under Peterson lake and one on the Silver Leaf property, that lie in Keewatin beneath the sill. These veins run upward to the lower face of the sill but not into it (Fig. 7, page 5).

Richness of the Ore

The comparatively small width of the veins caused doubt in the minds of some of the first engineers who visited the area, after the discovery of ore was reported, as to the economic importance of the veins. The richness of the ore and the multitude of veins have, however, more than compensated for the narrowness.

For some time after mining began at Cobalt the ore was shipped to the sampling works of Ledoux and Company. In an interesting description of the character of the ore Dr. A. R. Ledoux says that the shipment that carried the highest values contained 7,402 ounces of silver to the ton, the next in order being 6,909, 6,413, 6,163 and 5,948 ounces to the ton. The average percentages of other metals in the 366 carload lots sampled by this firm were: cobalt 5.99, nickel 3.66, arsenic 27.12.

The great richness of the ore extracted from one of the first veins worked at Cobalt is shown by a shipment made from the Trethewey mine, one carload of ore,

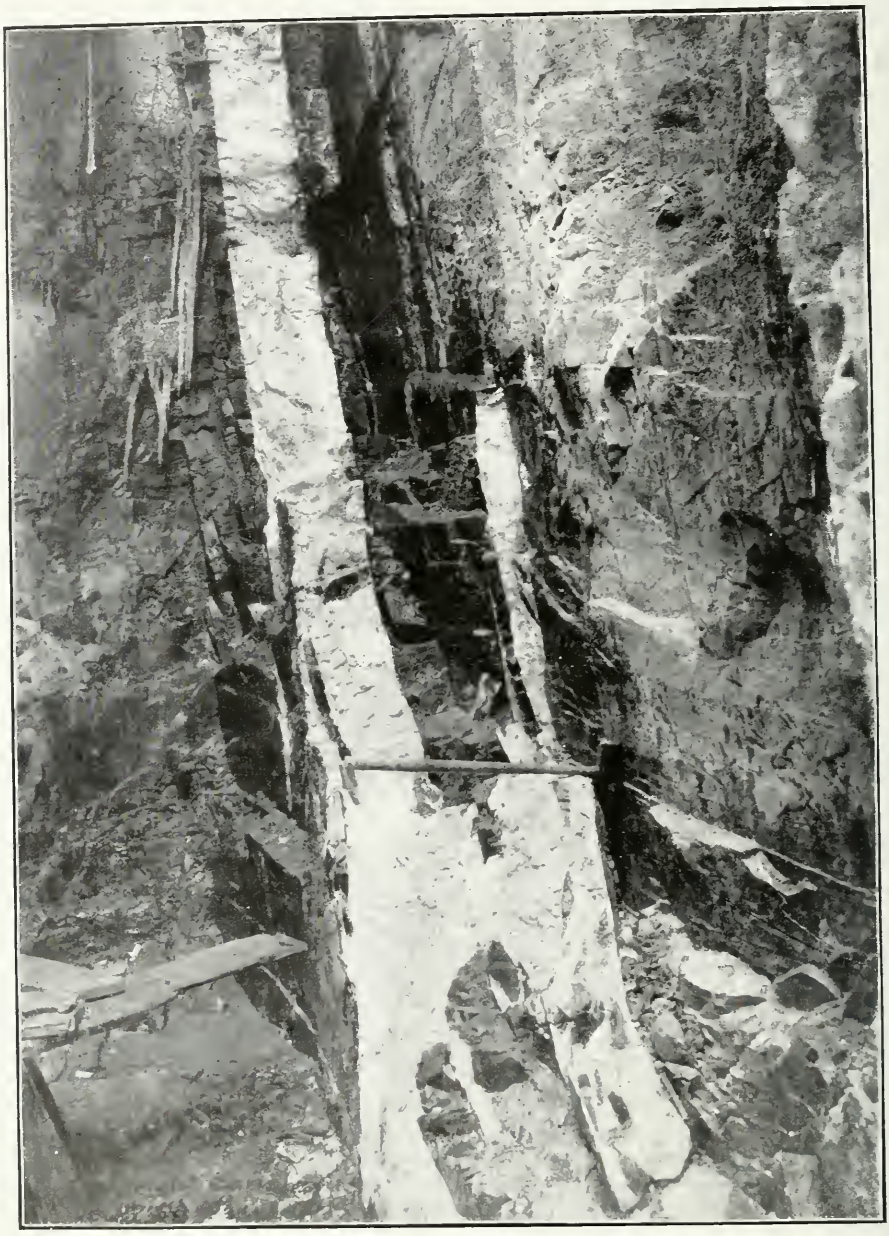

Fig. 54.—Carson vein on Crown Reserve property, Kerr lake.

containing thirty tons, being sold for between $75,000 and $80,000. Another shipment, consisting of fifty tons of ore, gave on analysis approximately the following percentages of metals: arsenic 38, cobalt 12, nickel 3.5. The shipment contained 180,000 ounces of silver. An open cut or trench, about 50 feet long and 25 feet deep, on the vein produced approximately $200,000 worth of ore. The maximum width of the vein was not over eight inches.

Certain shipments during later years have exceeded in value the early shipments from the Trethewey.

Speaking of the high grade ores of Cobalt, Mr. R. B. Watson says: "A typical ore carries 10 per cent. silver, 9 per cent. cobalt, 6 per cent. nickel, and 39 per cent. arsenic; the rest is lime, silica, and smaller amounts of antimony, iron, sulphur, tellurium, etc."*

The most productive vein in the area has been that known as the Carson. This vein on the Crown Reserve property, together with its extension on the adjoining Kerr Lake property, has produced about 14,000,000 ounces of silver, all the ore having come from above the 200-foot level. It has been estimated that the total production, including that already mined, from this one vein will be 20,000,000 ounces or more.

The richness of the ore in various mines in the area is also well indicated by what it has cost, on the average, to produce an ounce of silver. In 1911, for example, the cost per ounce, including mining and all other expenses, given in the annual reports of certain companies was: at the Crown Reserve 10.761 cents, at the Coniagas 8.8, at the Nipissing 13.95, and at the Kerr Lake 14.69.

The ratio of dividends paid by the companies to the total value of the ore produced, given on other pages of this report, shows in a more general way the character of the ore (page 37).

Probable Total Number of Productive Veins

In an interesting paper, Mr. Geo. R. Mickle has attempted to estimate the number of productive veins that the Cobalt area will have furnished before its productivity in silver ceases.†

The quotations below are taken from this paper:—

"In the following estimate certain arbitrary standards are adopted for the purpose of making definite calculations. Veins that have a certain minimum yield in ounces are called productive. It is obvious that the line must be drawn somewhere; it would be absurd to consider a vein that yielded a few sacks of ore as productive, and as it was desirable to compare this district with others where any vein with only a trifling yield would probably be lost in the records, the minimum output of a productive vein is assumed in the following calculation as 75,000 ounces.

"Up to July, 1911, there appeared to be 111 veins that could be considered productive on this basis; these were distributed among the geological formations as follows:

Huronian (Cobalt series)	86 veins or	77.5%
Diabase	12 " "	10.8%
Keewatin	13 " "	11.7%
	111 veins or	100.0%

"If the same vein extended into two different formations it was credited to the one out of which the greater part of the silver was obtained. In 1907 at the same time of the year the writer gave the distribution as:—(Vol. XIII, Jour. Can. Min. Inst.)

Huronian (Cobalt series)	53 veins or	80.3%
Diabase	7 " "	10.6%
Keewatin	6 " "	9.1%
	66 veins or	100.0%

*Eng. and Min. Journal, Dec. 7th, 1912. "Nipissing High Grade Mill, Cobalt."
†The Probable Total Production of Silver from the Cobalt District, Jour. Can. Min. Inst., 1912.

"Four years of energetic and skilful prospecting have not altered the relative number of veins in the different formations. The productivity, however, of the veins in these different rocks is not the same. Up to the present (i.e., July, 1911) the yield from the diabase has been approximately 7.55 million oz. from 12 veins, or 629,000 per vein, or 7 per cent. of the total production. The Keewatin with 13 veins has produced 11.7 million oz., or nearly 1 million per vein, or 10.85 per cent. of the total. This includes whatever silver was obtained in the Keewatin from veins classed as Huronian but extending into the Keewatin. The balance, or 88.55 million oz., has been derived from the Huronian, with 86 veins, or a little over 1 million oz. per vein and over 82 per cent. of the total production. According to the writer's estimate, when all veins at present known are exhausted, the Huronian veins will have produced slightly under 2 million oz. per vein, or 86.6 of the total, leaving 13.4 per cent. to be distributed between the diabase and Keewatin. It is plain, therefore, if the amount of silver in the Huronian veins can be approximately determined, even a serious error in the estimate of the other veins cannot vitiate the result very much.

"The total yield from the discovered veins should be 206.4 million ounces.

"Multiplying the average thus obtained by the probable number of veins yet to be discovered, viz., 21, gives over 35 million ounces (viz., 35.5) as the production from the undiscovered veins, giving thus a probable total of silver from all sources of 242 million ounces."

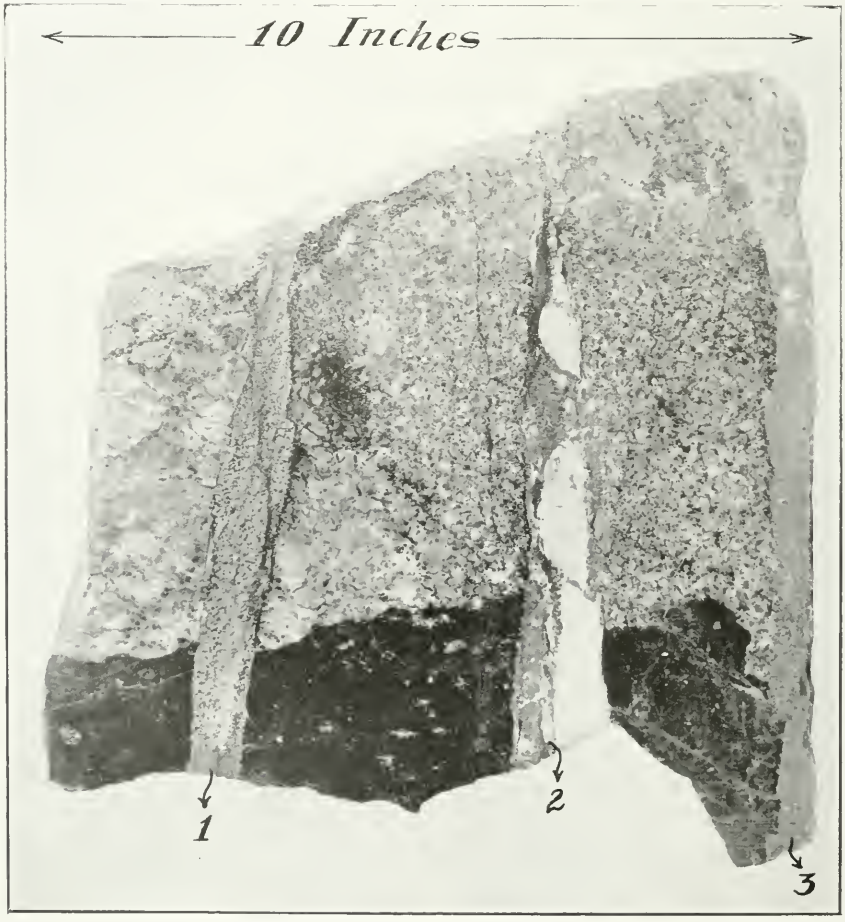

Fig. 54a.—Three veins in light-colored boulder of granite from conglomerate of Trethewey mine. 1 contains smaltite and native silver; 2 has the same minerals with considerable white calcite; 3 is essentially smaltite.

DISTRIBUTION OF COBALT ORES IN THE DISTRICT

From the following notes it will be seen that cobalt minerals are widely distributed over the district (Figs. 22, 51.).

Outside of the small area of about six square miles that lies adjacent to Cobalt station, the most important mines that are, or have been producers of cobalt-silver ores, lie in somewhat widely separated localities. They include two or three in a part of the township of Bucke, four miles to the northeast of Cobalt, one or two which are now important producers in the township of Casey, fifteen miles to the north, a similar number in the township of South Lorrain, fifteen miles to the southeast, and those near Elk Lake and Gowganda, 40 to 60 miles a little north of west from Cobalt. Small shipments were also made from the vicinity of Maple mountain, in Whitson township, thirty miles west of Cobalt. These outlying areas are described on following pages.

Native silver has also been found with cobalt bloom in veins carrying a high percentage of barite, and a little fluorite, in the township of Langmuir, near Porcupine, one hundred miles northwest of Cobalt. A description of these veins by Mr. A. G. Burrows is given in Chapter II.

As showing the still wider distribution of cobalt, or cobalt and silver ores in Northern Ontario, reference may be made to the discovery of cobaltite and native bismuth in the township of Otter, north of the town of Thessalon, about 190 miles southwest of Cobalt, described in Chapter II. of this report, and to the discoveries made many years ago of similar ores to those of Cobalt in small quantities on Michipicoten Island, Lake Superior. The Silver Islet deposit and others near the north end of Lake Superior are referred to in Chapter III. These are distant about 500 miles from Cobalt. Native silver, as is well known, occurs in the native copper deposits of Michigan. It would seem that the Keweenawan basic igneous rocks of that state, the norite of Sudbury and the Nipissing diabase of Cobalt are genetically connected.

Less Important Occurrences

Thirty miles north of Cobalt, on lots 9 and 10 in the sixth concession of the township of Ingram and elsewhere in the vicinity, quartz veinlets in diabase contain cobalt bloom and smaltite. The area is described on following pages.

Near Anima-Nipissing lake, shown on the accompanying geological map, scale 1 mile to 1 inch, much cobalt bloom has been found. The lake lies on the same line of weakness as Cobalt lake, and is about twelve miles to the southwest of the latter.

On the north end of lot 2 in the third concession of the township of Dymond and on the south end of the lot across the road to the north, cobalt bloom occurs in diabase. The knoll of diabase is overlain around its base by fragmentary rocks which have at one time undoubtedly covered the whole mass of diabase. The lots mentioned lie about ten miles north of Cobalt.

Ore at Rabbit Lake

A peculiar occurrence of cobalt and nickel with gold was discovered in 1905 on Rabbit lake east of Temagami and about 30 miles south of Cobalt station. The outcrop was at the water's edge. The rocks here have been more disturbed and are much more highly metamorphosed than are those in the vicinity of Cobalt station. They appear, however, to belong to the conglomerate-greywacké series. The ore body, about 18 inches wide, is in a zone of fracture. Through the chlorite schist which occupies this disturbed zone is a reddish felsitic material, which, under the microscope, is seen to belong to the fragmental series. Veinlets and impregnations of a grey cobalt-nickel ore occur sparingly in both the chloritic and felsitic material. An analysis of some of the more highly mineralized material gave the following results:

	Per cent.
Arsenic	22.53
Cobalt	8.76
Nickel	6.56
Gold	$8.80 a ton.
Silver	1.10

This unique deposit is of interest since it shows that cobalt-nickel ores are to be looked for so far south of Cobalt station. The Rabbit lake occurrence is about the same distance south of Cobalt station as those of the township of Ingram are north of it, thus showing that the cobalt-nickel ores are distributed over a distance of at least 60 miles in a north and south direction.

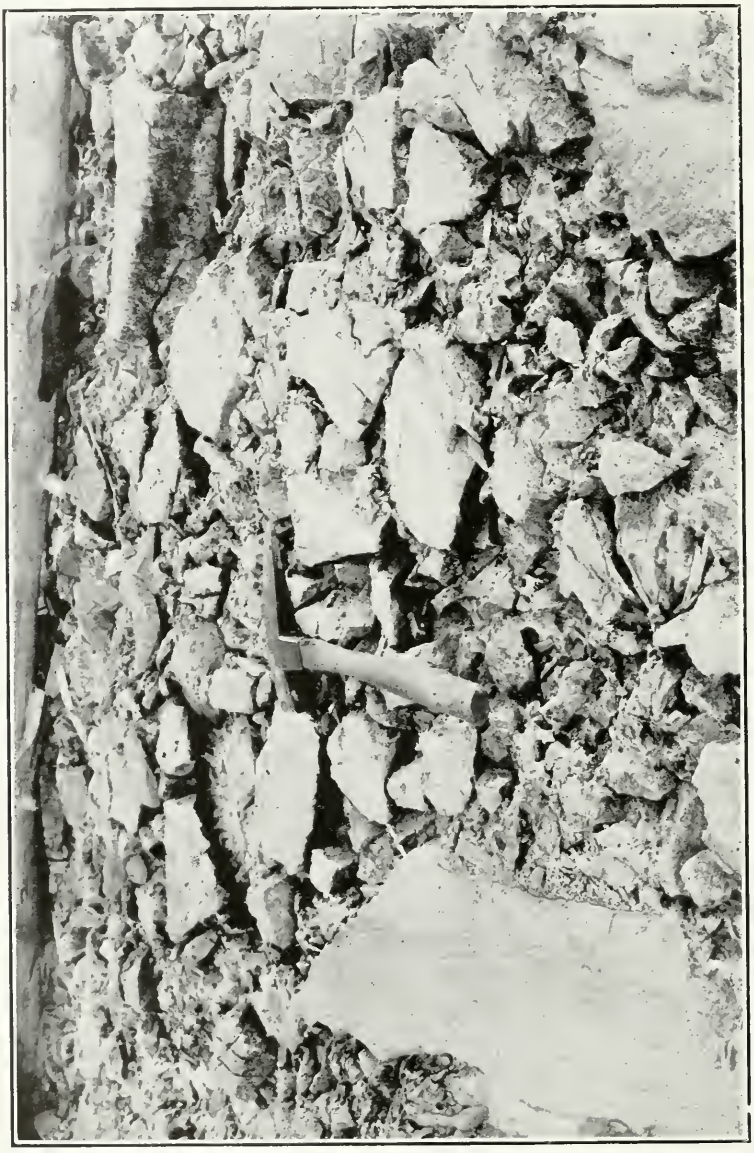

Fig. 55.—Part of surface of ore body at Wright mine. Fragments of rock are cemented by calcite, which has weathered, leaving the fragments projecting above it.

Other Silver Ores of the Region Surrounding Cobalt

What has been known for years as the Wright silver mine is on the Quebec shore of lake Temiskaming. It is distant about nine miles northeastward of Cobalt station and lies about seven miles northward of the village of Ville Marie. Some of the rock here is conglomerate, associated with which is porphyry. The latter is similar to rock in Minnesota which has been considered to be of doubtful origin. The ore body lies in a

zone of fracture which penetrates both of the rocks mentioned. Angular fragments of these rocks, sometimes a foot or more in diameter, are cemented together by calcite and galena (Fig. 55). The pure galena has been found to contain from 18 to 24 ozs. of silver to the ton of 2,000 lbs. Iron pyrites is found in small quantities associated with the galena, and is thought to be the source of the trace of gold usually present in the ore.

The writer visited this mine when it was in operation in 1901. The depth of the workings, which in the lower levels had the form of a circular chamber, was said to be about 200 feet. Work ceased shortly after this and has not been resumed. The equipment consists of a concentrating plant, including jigs, tables and other machinery. There is also a small smelter on the grounds. Considerable capital appears to have been expended in experimenting. Whether the deposit could be worked at a profit under proper management does not seem to have been proved. The concentrates were shipped to Europe.

The ore body is unique. An outcrop near the water's level together with the material on the dump afford an opportunity of learning its character. Two or three rather basic dikes are seen near the workings. These are probably of the same age as the fracture zone now occupied by the ore body. The location of this mineral deposit, one of the oldest known in North America, is shown in Fig. 6, Ance à la Mine.

On Lady Evelyn and Cross Lakes

Silver-bearing galena is also found at Cross lake, which lies southeast of lake Temagami, and at Lady Evelyn lake. According to Dr. Barlow there are quartz veins on the Mattawapika, as the last stretch of Lady Evelyn lake, before reaching the Montreal river, is called. These quartz veins are found here on both sides of the lake, and occur at the contact of the intrusive diabase and the banded slate, and in the latter. The minerals are galena, copper pyrites, iron pyrites, and zinc blende.

There is a deposit on an island in Cross lake, which lies immediately east of the south arm of Temagami. The minerals are galena and copper pyrites in calcite. A sample showed the following values per ton: gold $2.00, silver $9.20, copper $4.20, lead $4.00, or a total of $19.40.

Galena and copper pyrites have also attracted attention in the vicinity of the Blanche river, especially along the upper part of the north branch.

Fig. 55a.—Canadian Bank of Commerce, Cobalt, July, 1905.

PROSPECTING

When the veins were discovered in the vicinity of what is now known as Cobalt, the area was in a virgin state. A large part of the surface was covered with glacial and other loose deposits, and all of it was occupied by green timber. Prospecting was thus made difficult. Only about half a dozen veins were exposed at the surface. Most of those since discovered have been found by trenching through the loose deposits to bed rock. Hundreds of miles of trenches have been dug. The accompanying illustration shows the character of the trenches on a part of the Nipissing property (Fig. 56).

On the Nipissing streams of water under strong pressure have also been employed in removing the loose deposits and exposing the rock beneath.

It may be added that a considerable number of veins have been discovered by drifts and cross-cuts in the underground workings. Some of these are "blind" veins, i.e., they do not come to the surface.

In the notes which accompanied the first edition of our map of the Cobalt area we advised prospectors to pay special attention to the conglomerate areas. This was owing to the fact that the veins then known, with the exception of one or two in the diabase, occur in the conglomerate. Moreover, we believed that the Keewatin being a tougher rock would contain fewer fractures. The edition of the map was published in the spring of 1905, in time for the prospectors who were then entering the field. Much of the area then open for prospecting contained conglomerate. Our advice to the prospectors has been verified, as the great majority of the veins since discovered in the Cobalt area are in the conglomerate. Of course after the conglomerate areas had all been staked the less promising Keewatin and diabase areas became more worthy of attention.

It may be added that when mining began on some of the veins in the conglomerate the writer told the operators that he thought the veins would hold their silver values until the underlying Keewatin was reached, but that he did not think the veins would be productive in the Keewatin. This proved to be the case. It cost some of the operators considerable money to convince themselves of this fact. On reaching the Keewatin they sank and drifted in a vain search for more rich ore. During the time of the "boom" the theory that the Keewatin is less promising than the conglomerate was especially unpopular.

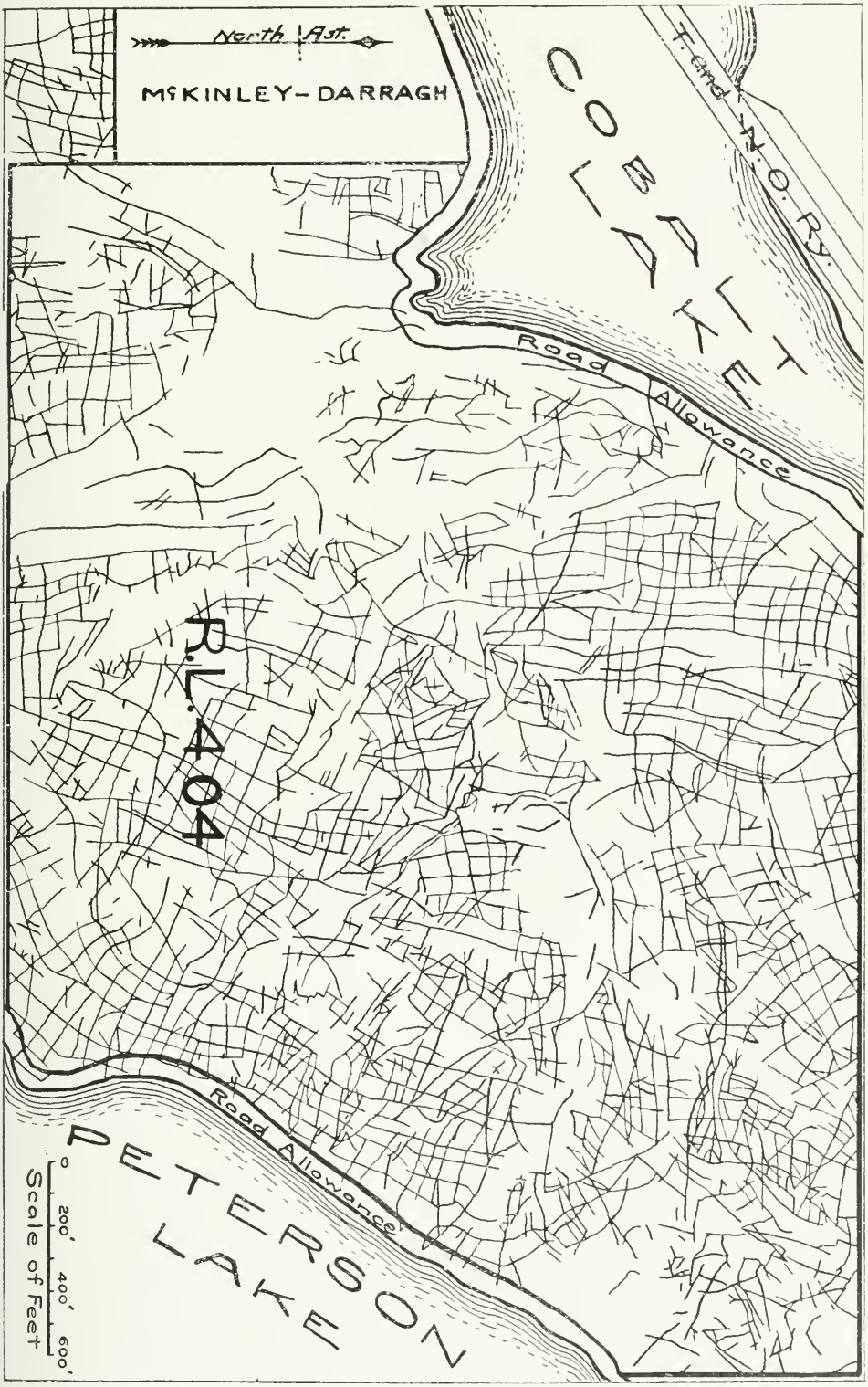

Fig. 56.—Trenches through the loose deposits to the compact rock, illustrating method of prospecting for cobalt-silver veins.

CHAPTER II

The Outlying Cobalt-Silver Areas*

SOUTH LORRAIN SILVER AREA†

By A. G. Burrows

This area first attracted attention in December, 1907, when a very promising discovery of native silver was made on a claim now known as the Keeley mine (H R 19). A rush followed this discovery, and soon almost the whole area was under staking as mining claims.

The central portion of South Lorrain is about sixteen miles southeast of the town of Cobalt. The camp is most easily reached during the open season, by steamer from Haileybury, from which town it is distant about twenty-two miles. Communication is continued during the winter, over a sleigh road on lake Temiskaming. A government wharf has been constructed just north of the townsite of Sixty-six. From the latter place, a good wagon road extends westerly, by way of Loon lake, a distance of three miles, to the Keeley mine. Another road has been built by the Ontario government, just north of the wharf, and opens up another stretch of country. From these roads, old timber roads or trails may be followed to any part of the area. Lumbering has been carried on for years, so that almost all the pine has been removed. During 1908 serious forest fires destroyed much timber which would have been suitable for mining purposes.

Topography

The surface of the country is very rough and hilly, and many small lakes lie in the depressions. The shore line is bold, and the hills rise abruptly from the lake. The hills and ridges are very conspicuous surface features, and are generally found to consist of one geological formation. In consequence, the contacts are usually in the valleys and covered. This fact is well exemplified by a glance at the map, which shows almost all the lakes to lie in contact planes.

In following the road from lake Temiskaming to the Keeley mine, there is almost a continuous ascent. The shaft at the Keeley mine has an elevation of 571 feet and the bridge south of Loon lake an elevation of 323 feet above lake Temiskaming. These elevations are relative to the level of lake Temiskaming on July 15th, 1908, when the water in the lake was higher than the average. The high water elevation of lake Temiskaming is 592 feet above sea level.‡

Classification of Rocks

In this area, the formations are found to conform to the scheme proposed by Dr. W. G. Miller for the Cobalt area. The writer did not, however, see any unconformity between the quartzite-arkose series and the conglomerate-slate of the Cobalt series.

GLACIAL AND RECENT

Boulder-clay, sand, gravel, etc.

Great Unconformity

*The areas described in this chapter include South Lorrain and Casey Townships, Montreal river and Elk lake, with parts of adjacent townships, and Gowganda. Brief descriptions are given of other areas.

†This report on South Lorrain is a revision of that which was published with Part II. of the 18th Report of the Ontario Bureau of Mines. The area is shown on the colored geological map, scale 1 mile to 1 inch, that accompanies this volume.

‡Dictionary of Altitudes, Department of Interior, Ottawa.

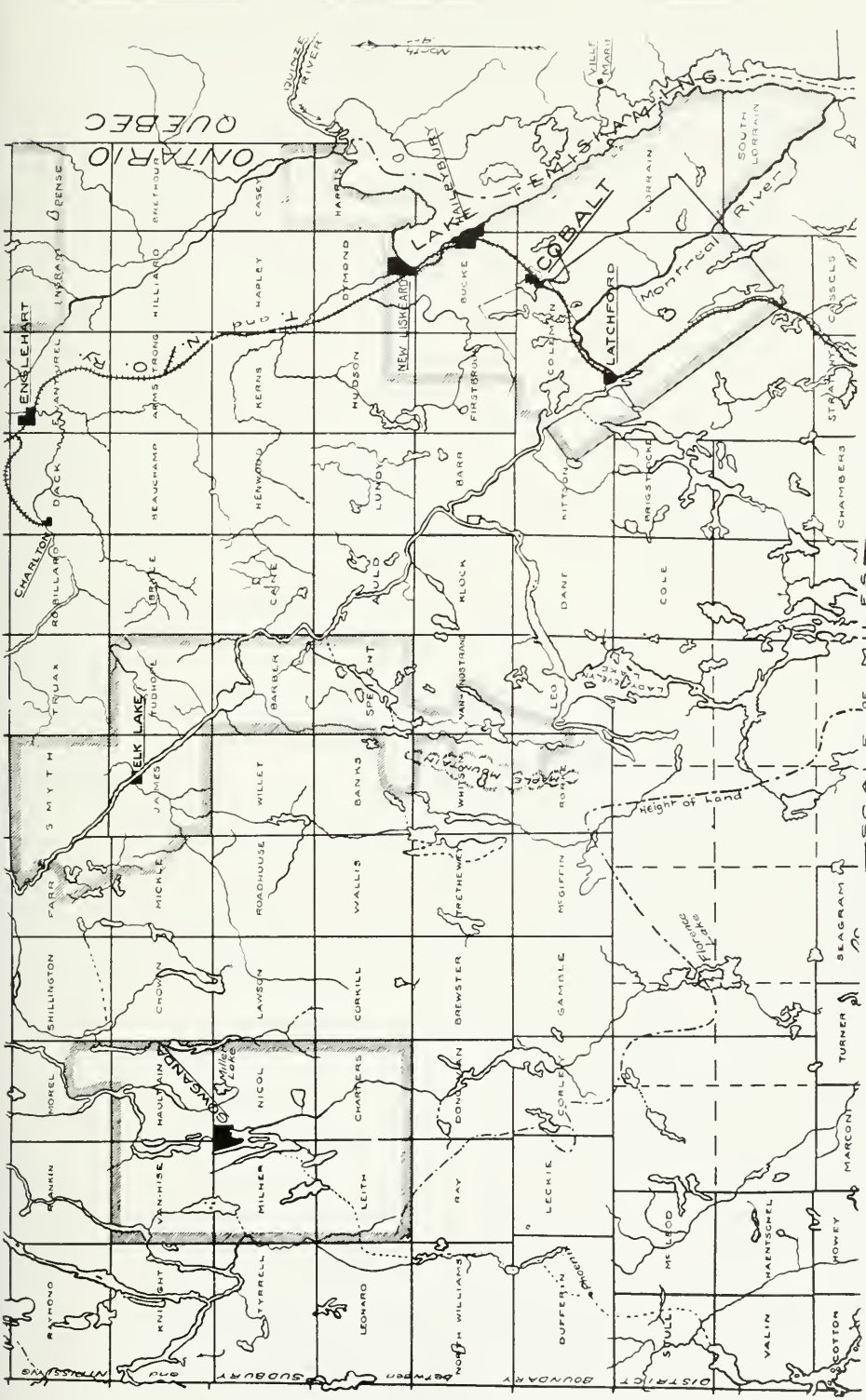

Fig. 57.—Map of Cobalt and outlying silver-cobalt areas. The areas enclosed by hatching have been mapped geologically.

PRE-CAMBRIAN

NIPISSING DIABASE

Igneous Contact

COBALT SERIES

Quartzite, arkose, conglomerate, slate, breccia.

Great Unconformity

LORRAIN GRANITE

Syenite, granite, intrusive into the Keewatin, but not into the Cobalt series.

Igneous Contact

KEEWATIN

An igneous complex, chiefly basic igneous rocks together with acid porphyries.

Fig. 58.—Overlooking Lake Temiskaming from hill south of "666," South Lorrain.

Glacial and Recent

Over considerable of the area there is a covering of drift, carrying the usual glacial boulders. On the summits of the ridges, the drift is sometimes very deep. The rock exposures are usually found along the slopes of the hills, where the drift is thinner. On the shore of lake Temiskaming just south of the townsite, the fine-grained green rocks well preserve the glacial striæ. On the main shore, just opposite a small rocky island, the striæ are very striking, and are due south (magnetic). At other points along the shore, there is a little variation to the east or west of south.

In the cutting of the government road just east of H R 69, the clay shows a stratified arrangement. Clay hills are seen along the shore of the lake, to the mouth of the Montreal river. Five miles up the river, the clay hills are very high and much cut by deep ravines.

The total distribution of the drift is not shown on the map, but only where the working out of the contacts was seriously interfered with.

Nipissing Diabase

This formation has its greatest development in the central portion of the area, where it occurs as a sill, extending westward from lake Temiskaming, around the north end of Loon lake, southwest to the east side of Trout lake, and north almost to the Lorrain boundary. In this area it occurs as a very prominent ridge. A smaller area is seen in the northwest portion, where it is associated with the quartzite. In appearance and texture the diabase is very similar to that described in Dr. Miller's Report on the Cobalt Area, Third Edition, and is essentially a quartz-diabase. A thin section of diabase taken from near the contact with the Keewatin on claim R L 471 shows a distinctly ophitic texture. Laths of plagioclase (labradorite) are embedded in a groundmass of augite, which is partially altered to greenish hornblende. Quartz in micrographic intergrowth with feldspar fills the interstices. A few grains of biotite and magnetite are also present. The feldspar is unusually fresh in the section.

A marked occurrence of the diabase is a dike, about five chains in width and traceable for two miles, intruding the quartzite. This may be seen east of G F 26, and a short distance south of the Lorrain boundary. The dike is very fine-grained on either side, and towards the centre has the normal diabase appearance.

There are smaller patches of diabase in the basic Keewatin areas, and these are difficult to distinguish as to age. Some of them are likely of the same age as the Nipissing diabase, but, owing to the difficulty of separation from the other rocks, are not shown on the map. A thin section of a diabase associated with the Keewatin on R L 468 shows rather fresh plagioclase set in the augite. The latter is greatly altered to green hornblende (uralite). Some grains of quartz are seen in the section.

Along the north line of G F 12 there is a reddish granitic rock, which is apparently of the same age as the diabase, and a separation from the same magma.

Contact with the Cobalt Series

Just north of the Keeley mine road, and west of Loon lake, on G F 13, the intrusive diabase (to the west) overlies the slate of the Cobalt series, at a high angle.

Cobalt Series

The predominating rocks are conglomerates and quartzites. The southern part of the area is composed essentially of conglomerates, varying considerably in appearance. The usual variety is that containing subangular and rounded boulders of granite, syenite and greenstone of varied size, in a groundmass of greenish chloritic material. At the "Notch" of the Montreal river, the rock is a greywacké conglomerate. A peculiar conglomerate is seen about one-half a mile south of Oxbow lake. Here the boulder inclusions are very few, and the surface shows rounded, pea-like inclusions, harder and darker than the surrounding rock. South of Trout lake on H R 163, in a high rounded hill, coarse boulder conglomerate overlies well-banded slate. At the south end of the same lake and to the east, conglomerate and slate overlie the Keewatin, which shows in a bluff.

Rocks near Mouth of Montreal River

The geology near the mouth of the Montreal river and the shore line of lake Temiskaming, north of the river, has been described as follows by Dr. A. E. Barlow:

"At the notch near the mouth, the river flows through an extremely narrow channel with rocky perpendicular walls composed of dark-greenish greywacké slate, much jointed and broken. This gorge has a breadth varying from sixteen to thirty-three feet, and is a little more than a hundred yards long, with perpendicular walls about forty feet high."

"The western shore of lake Temiskaming, from the Montreal river to Roche McLean, is occupied by the massive bedded breccia-conglomerate, which dips in a westerly direction at an angle of 15 degrees.

"In the breccia-conglomerate the matrix is often present in very subordinate quantity. The most abundant fragments are the usual biotite-granite type, while others of a pale granitic rock are seen in thin section under the microscope to consist of phenocrysts of plagioclase or orthoclase, embedded in a fine-grained quartz-feldspar groundmass.

"Besides these there are some fragments composed of a fine-grained altered diabase and others of a greenish-grey slaty rock (resembling in a most marked manner the compact variety of the greywacké of the Huronian) and some grey quartz. The material filling the interspaces is seen under the microscope to consist of a confused aggregate of scales and grains of chlorite and epidote, with abundantly disseminated particles of iron ore and fine granules of sphene and epidote."

Fig. 59.—The "Notch," near mouth of Montreal river.

"A specimen obtained from an exposure two miles north of the Montreal river, however, showed the matrix to be relatively more abundant than usual. The diabase pebbles are also more plentiful than those of red granite, while fragments of simple minerals predominate greatly over those of composite rocks. The quartz and feldspar fragments are sharply angular, while the composite individuals are as a rule somewhat rounded."*

Greywacke

Just west of the No. 3 post of H R 34 is an outcrop of greywacké which overlies the Keewatin and is overlain to the west by conglomerate.

The greywacké, in thin section, is seen to consist principally of orthoclase, finely twinned plagioclase and calcite, and in subordinate amount, chlorite and quartz. A fragment of greenstone was noticed in the section. This greywacké, which is very deceptive in appearance, was mistaken by prospectors for fine-grained diabase.

*Report on the Geology and Natural Resources of the area included by the Nipissing and Temiskaming map sheets, etc. A. E. Barlow, Tenth Report, Geological Survey, Canada, 1897.

Quartzite and Arkose

The quartzite and arkose have a great development in the north and west portions of the area. They are varied in color and texture, but are usually rather medium-grained, and the lines of stratification are not very noticeable. The prevailing colors are greenish, greyish, and reddish, and, in this area, the green variety is usually rather friable, whereas the red variety is hard and compact. These varieties seem to pass gradually one into the other on the same ridge. The chief constituents are quartz and feldspar, which are occasionally present in large angular fragments. The green color is due to the presence of sericite, an alteration product of feldspar, and was first noticed in the sea-green quartzites along the shore of lake Temiskaming. When the rock is coarse it is difficult to distinguish in the field from granite, particularly when the red feldspar is present.

In this area the prevailing dip of the rocks of the Cobalt series is to the west, varying to the northwest. Near the No. 1 post of L O 144, the slates dip to the west at an angle of 20 degrees. One mile west along the Keeley road from lake Temiskaming, and on H R 30, the slate and quartzite strike northeast and southwest and dip to the northwest. In the northwest portion of the area, near the No. 4 post of T C 77, the slates and quartzites dip to the southeast.

A breccia *in situ* is seen just east of No. 1 post, R S C 68. It is composed entirely of small angular fragments of greenstone, which is seen in place to the south. This is the lowest portion of the Cobalt series seen in this area.

West of the Keewatin area, which is shown to the north of Trout lake, the rocks of the Cobalt series have been laid down in the following order. The Keewatin is usually overlain by a conglomerate, sometimes slaty. Above this, there is a narrow band of reddish banded slate, rather quartzoze toward the upper portion, and overlying the latter there is a large area of quartzites and arkoses, with very little evidence of stratification. The breccia, mentioned above, was only noted at the one point in a very small outcrop.

Lorrain Granite

The Lorrain granite is represented in the northeast portion of the area, by a reddish hornblende syenite, in which flesh-colored feldspar and greenish black hornblende are easily recognized. In thin section, in addition to the orthoclase, there is abundant acid plagioclase and microcline. The hornblende is the common green variety, very pleochroic, and shows the distinctive prismatic cleavage and angles of the amphiboles. Quartz is present in smaller grains than the feldspar, and is not prominent enough for a granite. Sphene and magnetite occur as accessory minerals.

Throughout the syenite are rather rounded patches usually darker in color, but which are composed of the same constituents. These are basic secretions from the original magma, formed during the process of cooling. There are also some very small patches, which are apparently remnants of a conglomerate formerly overlying the syenite.

Where the syenite comes in contact with the Keewatin to the south, it is found to be younger, enclosing fragments of the greenstone, and occasionally intruding, for some distance, the older rock. On L O 153 the syenite is intruded by a very basic trap dike, ten feet wide and striking east and west.

Keewatin

The rocks of this series occur in several isolated areas. They are usually altered basic igneous rocks, both massive and schistose. The largest exposure extends N.N.E. from Trout lake for two miles. These are, in great part, greenish weathering rocks. The most typical portion is fine-grained, with a slaty appearance when fractured. Throughout the fine-grained rock are bands of coarser varieties, now much altered to amphibolite.

Just south of Loon lake, on H R 57, the Keewatin is represented by very coarse massive amphibolites, which are highly mineralized with magnetite and iron pyrites.

Quite different in appearance from those above mentioned are the metamorphosed rocks three-quarters of a mile south of Loon lake, and extending from H R 114 to lake Temiskaming. These are seen as highly tilted bands, with a general strike a little north of east and almost vertical dip to the north. At the west end of this belt the prominent rock is light colored, weathering to an ashy gray. When freshly broken it has almost a cherty appearance and is exceedingly fine-grained. Locally it is much twisted and crumpled. Thin sections of two samples of this rock showed the original character to be entirely destroyed. The constituents are exceedingly fine-grained and secondary, consisting of quartz, feldspar, chlorite and hornblende or mica.

Folded in the bands of this schistose rock are small dikes of light colored porphyries, showing phenocrysts of reddish feldspar.

A thin section from one of these dikes, near the No. 1 post of H R 114, shows phenocrysts of orthoclase and plagioclase, traversed by numerous small veinlets of epidote and hornblende. The groundmass is a granular mixture of feldspar and quartz, with needles of hornblende. Other dikes of porphyry are much fresher in appearance and seem to be younger in age.

On following this belt to the east, the rocks become darker in color and more chloritic. On H R 186 is a typical chlorite schist, striking E.N.E., and dipping to the N.N.W. at a high angle. This rock breaks into curved cleavage plates, and is traversed by numerous small torsion cracks, filled with calcite. On H R 119 and 120 the schist is intruded by a large dike of white weathering porphyry, with colorless phenocrysts of feldspar and quartz.

Small veins of quartz, impregnated with iron pyrites, cut the schist in this vicinity. On H R 140 one of these carries low values in gold.

There is a belt of somewhat similar Keewatin rocks immediately south of Oxbow lake.

Keewatin West of Point Fine

The formation consists principally of rusty, metamorphosed, basic igneous rocks, which may now be classed as amphibolites. In several thin sections, the ferromagnesian mineral is shown to be green secondary hornblende. Just north of No. 1 post of R L 469, the amphibolite is much intersected by veinlets of rusty quartz and iron pyrites. These veinlets stand out very strikingly as a ribbed structure from the dark rock. A thin section of the rock shows it to consist of small rods and patches of green hornblende, partly in parallel arrangement, grains of epidote and clear secondary feldspar. The original character of the rock is obliterated. On H R 74 much of the rock is very fine-grained and intersected by veinlets of epidote and iron pyrites. A thin section shows the rock to be an alteration of a fine-grained diabase, as the ophitic texture is shown clearly in the rods of altered plagioclase. The albite twinning in the feldspar is occasionally seen. The augite has been altered entirely to green hornblende. A coarser grained rock, outcropping near the No. 1 post of R L 465, has resulted from the alteration of a gabbro. The feldspar is now altered to saussuritic minerals, and the pyroxene has changed to a very pleochroic green hornblende, now showing with ragged outline and bent forms. Only occasionally in this belt do the rocks show a schistose structure.

Discoveries

The principal discoveries here have been made near the line of contact of the Nipissing diabase and the Keewatin in the area to the north of Trout lake. Along this contact, usually within a quarter of a mile, discoveries of native silver or smaltite have been made in both formations. The Wettlaufer veins are in the diabase, whereas the Keeley veins are in the Keewatin. Toward the north end of this belt the discoveries so far consist of smaltite and niccolite. Small showings of native silver have

been found in other isolated areas of the Keewatin or diabase. The writer does not know of any discoveries of native silver in the conglomerate or quartzite, although both these rocks are seen in contact with the Nipissing diabase. In this respect the conglomerate of South Lorrain resembles that around Elk lake, in which no native silver discoveries, as far as is known, have been made.

In the following is a description of a few of the promising veins on some of the properties:—

Wettlaufer

On the Wettlaufer claim, H R 85, there were found three parallel veins with a strike N.E. and S.W. Of these, the two northerly veins had rich shoots showing native

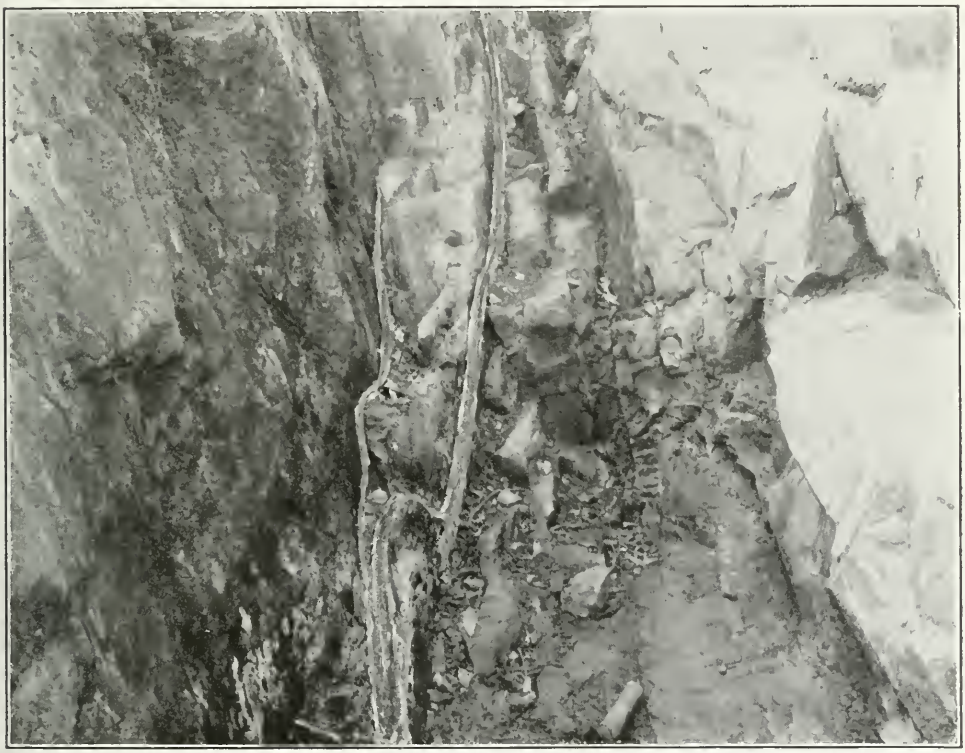

Fig. 60.—A vein showing in pit on the Wettlaufer property, South Lorrain, October, 1908.

silver in sheet form, while the south vein carried smaltite with low silver values. The veins were narrow, but parts of them attained a width of six inches. Flake silver is shot into the diabase wall rock from one to three inches. The distance from the north to the south vein is about ninety feet.

The following information on development is taken from Mr. E. T. Corkill's Report on "Mines of Ontario," in 21st Annual Report Bureau of Mines, 1912.

"The Wettlaufer is the largest and the only steady producer in South Lorrain. It is owned and operated by the Wettlaufer Lorrain Silver Mines, Limited, which have an authorized capital of 1,500,000 shares, of a par value of $1.00, and have paid $450,000 in dividends to June 1st, 1912.

"On the advent of electric power to the camp from the British Canadian Power Company, a new plant was installed, consisting of a 12-drill compressor, driven by a 200-h.p. motor. A 30-ton concentrating mill has been erected.

"The main shaft has been sunk to the fourth level, a depth of 250 feet. Levels have been run at depths of 65 feet, 140 feet, 185 feet and 250 feet. The vein has been developed for a length of about 500 feet, the drifts on each level having been run approximately this distance. A winze was sunk at a point 210 feet southwest of the shaft from the fourth to the fifth level, and a drift run south 160 feet and north 70 feet.

"The winze has since been sunk to the sixth level.

Bellellen

"On claim R L 470 the Bellellen Silver Mines, Limited, have carried on considerable development work. No. 1 shaft is 80 feet deep, with 144 feet and 114 feet of drifting north and south of the shaft on the 80-foot level; some stoping has been done. No. 2 shaft is 100 feet deep, with 200 feet of drifting and cross-cutting at the 100-foot level.

"The plant consists of a 20-h.p. boiler and hoist.

King George

"Active development work was carried on during 1911 on claims H R 110 and 170. The main shaft has been sunk a depth of 272 feet, with 30 feet of cross-cutting at the 250-foot level.

"The power plant consists of a 5-drill compressor, driven by a 75-h.p. motor, and a hoist. Electric power is obtained from the British Canadian Power Company.

Montrose

"Work on R L 459 was carried on part of the year by the Montrose Cobalt Mining Company. A shaft was sunk a depth of 110 feet.

Sharp Lake

"On claim B C 100 the Sharp Lake Mines, Limited, have sunk a shaft a depth of 50 feet. At the 50-foot level a drift has been run south 145 feet and east 60 feet."

Keeley

At the Keeley mine, H R 19, considerable development has been done. At the shaft on the main vein, No. 1, the strike is S. 62° E. The silver occurs in wire form, flake-like sheets and hair-like tufts, associated with smaltite in a gangue of quartz and calcite. Quartz is very prominent in the vein, and is associated with the best values.

The main shaft on the original discovery has been sunk to a depth of 150 feet. At the 65-foot level, 300 feet of drifting has been done on the vein, and about 60 tons of shipping ore have been taken out and bagged. The shaft is in the Keewatin formation. Dikes of old diabase have been encountered. At a depth of 130 feet crosscuts have been driven 75 feet east and west respectively. Associated with the ore is more or less cobaltite. A sulphide of copper and silver, probably stromeyerite, has been found in the No. 1 vein. Shaft No. 3, about 600 feet south of No. 1, is 70 feet in depth.

A sample of massive ore from a vein near the west side line of this property, analyzed by Mr. N. L. Turner, Provincial Assayer, shows it to be smaltite-chloanthite, with the following composition:

Cobalt	10.00%
Nickel	8.16%
Arsenic	68.72%
Sulphur	.42%
Silver	8.7 oz. per ton

Jowsey-Woods

On H R 21 there are several calcite veins and one of them has shown on development native silver. This vein is near the east side line and strikes about N.N.E. A shaft has been sunk to a depth of 110 feet, and on the 75-foot level 75 feet of drifting has been done. The gangue is calcite, which has a very fine cryptocrystalline texture, associated in bands with quartz and decomposed material. Leaf silver, in small flakes, has been found in the vein, associated with smaltite, copper pyrites and native bismuth. Minute crystals of chloanthite are scattered through the gangue.

On H R 16 (Haileybury Silver Mining Company) the original discoveries were smaltite and niccolite. A sample of the massive ore has the following composition:

Cobalt	15.92%
Nickel	11.18%
Arsenic	60.38%
Silver	trace.

The vein has a strike of S. 20° E., and dips 70° to the east.

On this vein a shaft has been sunk to a depth of 100 feet, and about 15 tons of massive smaltite have been obtained. Twenty-five feet of drifting have been done at this level. The chief vein filling is calcite and decomposed material.

Later a vein showing native silver was discovered on the south half of the claim.

Frontier

The south half of H R 16 was sold to the Haileybury Frontier Mining Company. A shaft has been sunk on the vein to a depth of 90 feet. At this level drifting was carried 60 feet to the northeast and 125 feet to the southwest. No. 2 shaft, about 500 feet southwest of No. 1, is 110 feet deep, with some crosscutting. The veins on this property are in the Keewatin.

On H S 42 (Forneri claim) there is a vein about 3 inches in width, with strike N. N. E., and occurring in the conglomerate. The vein material is smaltite and copper pyrites in calcite and quartz. A surface sample on assay showed no silver values. A shaft has been sunk to a depth of 75 feet. At 35 feet the vein dipped from the shaft. It is reported that silver values were obtained on assay at 14 feet depth.

On R L 471, near the east side line, there is a strong vein of massive smaltite, on which a shaft has been sunk 65 feet. The vein is in the Keewatin.

On H R 106, adjoining Trout lake on the northeast, a five by seven shaft has been sunk 50 feet on a calcite vein carrying smaltite.

On T C 73 there is a shaft down 40 feet on a calcite vein with disseminated smaltite and copper pyrites. These veins have not proved to carry appreciable silver values. The rock is the Nipissing diabase.

On H R 69 (Maiden claim) there has been extensive development work. Near the east side line, a tunnel has been driven from the base of a hill a distance of 285 feet on a calcite vein. At 100 feet a winze has been sunk to a depth of 60 feet. The vein in places has a width of 12 inches. Smaltite and niccolite are found in bunches in the vein. Low silver values are reported to have been obtained on assay. On vein No. 2 to the west a tunnel has been driven 225 feet. The vein filling is chiefly calcite with smaltite and niccolite in portions of the vein, 5 to 7 inches in width. The veins are in the Keewatin just north of the contact with the Nipissing diabase, and strike a little east of north.

On H R 14, near the west side line, some native silver has been obtained in a narrow vein in the diabase.

On T C 71, east of Loon lake, a tunnel has been driven 100 feet on a strong calcite vein about a foot in width.

At other parts of this area there has been considerable prospecting, consisting of trenching and sinking of small pits and shafts. Calcite veins are the most common type, the calcite being usually associated with more or less quartz, and carrying smaltite and

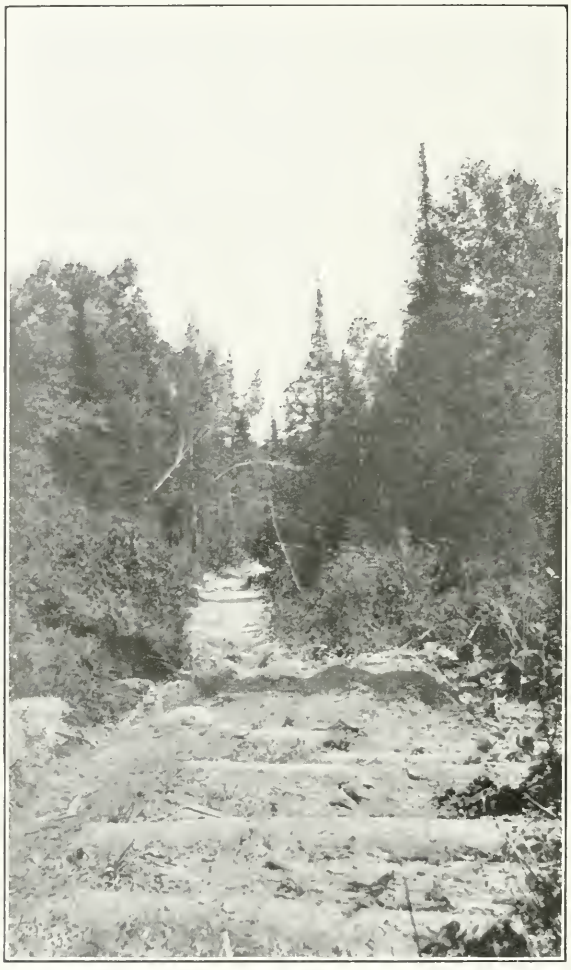

Fig. 61.—Old timber road, South Lorrain.

niccolite occasionally. These latter minerals have been found on a number of claims in well-defined veins.

Aplite dikes which are characteristic of many of the silver showings in the township of James and vicinity are of little importance in South Lorrain.

TOWNSHIPS OF CASEY AND HARRIS

By R. E. Hore

On August 14, 1906, with Mr. Gerald Galt, I went west from the Blanche river along the Casey-Harris township boundary to lot 5, Casey township. From our camp at this point we examined the country for about three miles around.*

Casey Cobalt

About one hundred yards west of the southeast corner of lot 5, concession 1, Casey township, cobalt bloom was discovered by David Bucknell. Mr. Bucknell having seen the silver veins in conglomerate rock at Cobalt, recalled an outcrop of similar rock on a neighbor's farm, returned home, and found a vein the same afternoon.

A shaft sunk on the vein disclosed an ore body which is in some parts five inches in width. The chief values are in cobalt, nickel and arsenic, which are present in the minerals smaltite, chloanthite and niccolite, in calcite gangue. No silver was seen in the ore. Partings in the slaty wall rock are frequently filled with sheets of native bismuth for a few inches from the vein.

The vein, where it outcrops at the foot of a conglomerate ridge strikes about 25 degrees north of east. A few feet east of the shaft it disappears under the drift. In the opposite direction it is not well defined, there being only a narrow crevice to indicate its extension up the hill to the west.

A similar, but smaller, vein was discovered during the summer, and it is said to contain some native silver. This vein is about fifty yards west of the first one, which strikes N. 70 degrees W.

Other Claims

Most of the surrounding country is heavily drift covered. Northwards the next outcrop of any extent is in the second concession. About one-half mile to the east a diabase ridge runs northwards. To the west is a low, flat, clay-covered area, which extends southwards to Sutton bay. To the south, however, a ridge of conglomerate, locally called Casey mountain, extends to Sutton creek, and thence eastward along the bay shore.

On the Murray claim, which adjoins the Casey Cobalt, there is a good showing of cobalt bloom. Elsewhere along the outcrop we did not see any important discoveries.

Development Work

At the time of our visit no work was being done on the Casey Cobalt and Murray properties, as negotiations for sale were under way. We could not make a closer examination of the Casey Cobalt vein as the shaft was nearly filled with water. This shaft was said to be only thirty-five feet deep, and consequently little is yet known of the extent of the ore body.

On several of the other properties pits have been sunk on small veins, without remarkable success. The rock has been well exposed in many places by forest fires, thus giving an opportunity for the prospector to work over the district rapidly. Most of the district is, however, heavily covered, and prospecting in the future must be slow and expensive.

Geology

There is a considerable variety in the rocks exposed in this small area. Greenstone, conglomerate and slate, basic and acid igneous intrusions, limestone and clay deposits are all found here.

*The area mapped by Mr. Hore is now included in the fourth edition of the Cobalt map, scale 1 mile to an inch. Mr. Hore's description of the area appeared in the third edition of the report. It has been revised and brought up to date by Mr. Knight. The area is now an important producer of silver. W. G. M.

The greenstone is much metamorphosed and is probably the oldest rock in the district and of Keewatin age. A hornblende syenite of reddish color, intruding Keewatin, may represent the Lorrain granite, on which was deposited the Cobalt series. Diabase intrudes the cobalt series. The limestone must have been deposited after a great lapse of time, as it has been determined to be of Niagara age.

Classification According to Age

	7. Post-Glacial	Clay.
	6. Glacial	Boulder clay, etc.
	5. Niagara	Limestone.
	Unconformity.	
Pre-Cambrian	4. Nipissing diabase.	
	Igneous contact.	
	3. Cobalt series	Conglomerate, arkose, greywacké.
	Unconformity.	
	2. Laurentian (Lorrain Granite)	Syenite.
	Igneous contact.	
	1. Keewatin	Greenstone.

Post-Glacial

A high percentage of this area, and of the district to the north and northwest, is overlain by a deposit of clay and clayey marl. An extensive belt of clay is found on either side of the Blanche river for several miles from its mouth. The river brings down annually a large quantity of similar material, which is deposited in the shallow waters at the head of lake Temiskaming.

Settlers are gradually getting these lands cleared, and find the soil is fairly well adapted for farming purposes.

Glacial

There is very little glacial drift in the area. The only occurrence of any extent is a moraine on the east of, and running parallel to, the Blanche river near Judge P.O.

Niagara

The Niagara limestone of Wabi point covers the western part of the townships of Casey and Harris. The rock outcrops here and there along a cliff, the level of the limestone being over fifty feet above that of the clay flats. Grey colored limestone, interbedded with shales, is the chief constituent of these sediments, which were years ago correlated with the Niagara of southern Ontario.*

Nipissing Diabase

This rock outcrops about one-half mile east of the Casey Cobalt discovery. The immediate contact with the sedimentary rocks is generally covered, and the delimitation of rock areas as shown on the map is therefore only approximate. In field appearance and in mineralogical composition, the several outcrops are quite similar to the diabase in localities to the north and south, where the field relations can be studied. It is therefore considered as part of the same magma as the sills of Cobalt and Wendigo districts.

A typical specimen is a dark gray, medium-grained, crystalline rock, composed of bronze colored augite and light colored feldspars. Nearly all the minerals are colorless in thin section. Under the microscope the large augite individuals are seen to enclose the lath-shaped crystals of feldspar. In subordinate amount are brown pleochroic biotite, green chlorite, and opaque iron ore,—ilmenite or magnetite. The typical diabasic structure is not generally detected by the naked eye, but, except in the coarser parts, is generally seen under the microscope.

*G. S. C., 1863.

The most extensive outcrops are in the southern parts of lots 7 and 8, concession 1, Casey, and in lot 6, concession 2, of Casey.

Cobalt Series

The Cobalt series is made up of greywacké slate, arkose and conglomerate.

Under the microscope the fine grained rock is seen to be composed largely of minute grains of quartz and feldspar, with here and there groups of larger particles of these minerals (körnige grauwacké). Chlorite is a common constituent of the rock, giving it a dark color.

Similar material to this, enclosing pebbles of syenite, granite, diorite, etc., makes up the greywacké conglomerate.

Underlying the conglomerate north of Sutton bay is a rather poorly defined layer of arkose. This consists of medium sized grains of quartz and feldspar and some chlorite.

This series of rocks is remarkably free from any evidence of great disturbance after deposition, and in general character is quite similar to the Cobalt series at Cobalt.

Besides the well exposed ridge, already mentioned and known as Casey mountain, there is an outcrop of considerable extent on lot 5, concession 2, Casey township. Small outcrops were found in lot 6, in concession 6, Harris, and concession 1, Casey.

Laurentian Syenite

Reddish colored syenite outcrops on lots 4 and 5, concession 2, Casey township. A somewhat conglomeratic appearance is given to the rock by the inclusion of fragments of greenstone, which it has picked up in forcing its way through the Keewatin series.

The most abundant mineral in the rock is orthoclase, which is quite reddish in color. Long slender crystals of dark green color, resembling actinolite, constitute the other chief constituent. Under the microscope these green crystals are found to be quite pleochroic, and many cross sections show the typical cleavage and crystal habit of hornblende. Small particles of quartz are found in nearly all specimens, but, as the quantity is quite subordinate to that of feldspar, the rock is nearer the syenite than the granite type. Other minerals are sphene, iron ores and some secondary chlorite. The petrographical character, and the lack of evidence of metamorphism and chemical alteration, shows that the syenite is later in age than the Keewatin. The field relations show that it is older than the Cobalt series.

The syenite here called Laurentian is probably of the same age as the Lorrain granite.

Contact of Laurentian and Cobalt Series

The contact of syenite and conglomerate is very well exposed for several yards. The conglomerate has evidently been formed by sedimentary deposits derived from the syenite and older rocks. At the immediate contact large angular blocks of syenite are cemented together by fine, gray material, forming a breccia conglomerate. A few feet from the syenite the fragments are well rounded, and farther on pebbles of other composition form a greater and greater percentage of the conglomerate, which then appears quite similar to the Cobalt series at Cobalt. Detailed examination may show that the former conglomerate is of later age than the latter; but from our rather hurried survey it seems that they are of the same character and probably deposited at the same time. The conclusion which we come to is, therefore, that the conglomerate is younger than the syenite.

Keewatin

A chloritic igneous rock of basic composition, containing irregular stringers of quartz, is exposed on lot 7, concession V, Harris township. In the field its green appearance distinguishes it from the later diabase.

A typical specimen is a dark colored fine grained crystalline rock, showing small crystals of light colored feldspar. Under the microscope it is seen to consist largely of grains of augite and small feldspar laths. That there has been considerable chemical

alteration is shown by the abundance of chlorite, which results from the decomposition of the augite. That the rock has suffered severe metamorphism is shown by the granulation of the augite individuals, and by wavy extinction in the feldspar crystals.

This outcrop is, therefore, probably an old hill top of Keewatin age, none of the later rocks in the vicinity being much metamorphosed.

Recent Development at Casey Cobalt

Since the above notes were written by Mr. Hore, now several years ago, much work has been done on the Casey-Cobalt, and it has recently become an important shipper. Mr. E. T. Corkill, chief inspector of mines, gives the following notes in the twenty-first report of the Bureau of Mines:—

"This property, situated on the southeast quarter of the south half of lot 5, in the first concession of Casey, about 10 miles northeast of the town of New Liskeard, is controlled by the Casey Cobalt Silver Mining Company, Limited, with an authorized capital of $100,000.

"The power plant consists of two 40-h.p. boilers, a straight line compressor and hoist. A larger power plant is now being installed.

"The shaft has been sunk on the vein, which dips to the southeast at an angle of 70 degrees, to the depth of 260 feet, with levels at 33 feet, 100 feet, 160 feet, 210 feet and 260 feet. Work done during the year was confined mainly to the 210-foot and 260-foot levels. On the 210-foot level, drifts were run northeast 60 feet, and southwest 100 feet. Just north of the shaft is a cross-cut 190 feet in length, and from the drift southeast of the shaft a cross-cut west 140 feet, where a new vein was encountered. On this vein 185 feet of drifting has been done, and a new shaft started. On the 260-foot level, a cross-cut was driven west 100 feet, and 225 feet of drifting done on the vein. A raise was also put through to the 210-foot level. Several car-loads of low-grade ore were shipped to the Northern Customs Concentrator at Cobalt for treatment."

In February, 1912, the mine was visited by C. W. Knight, who found that the shaft passed through 245 feet of conglomerate, greywacké and greywacké slate of the Cobalt series, after which it met with an older complex, consisting largely of igneous rocks, including lamprophyre and fine-grained greenstone; graphite schist was also encountered. In the Cobalt series a minor fault occurs in the lower levels, which has faulted one of the veins about seven feet.

In May, 1913, the property was visited by Messrs. Burrows and Knight. About a quarter of a mile northerly from the shaft of the Casey Cobalt the Nipissing diabase was seen resting on the sediments of the Cobalt series and dipping, apparently, gently to the east. It is probable that the diabase sill originally covered all the rocks on the present hill, it having now been largely eroded. At the Casey Cobalt there is a thickness of 300 feet or more of the Cobalt series. Conditions here are, therefore, similar to those at Cobalt where the greater part of the silver ore mined has been derived from veins in the Cobalt series beneath the Nipissing diabase sill.

AREA SOUTH OF LAKE WENDIGO

By R. E. Hore

On September 3, 1906, with Mr. Gerald Galt, I went to Tomstown to examine an area including parts of the townships of Ingram and Pense and unsurveyed territory northwards to Wendigo lake. In this area there have been several discoveries of small veins which show cobalt bloom in a quartz gangue. A few of them show massive smaltite. No native silver or argentite has yet been discovered. Small quantities of sphalerite and galena have been found in some of the veins.

The discoveries of bloom, which are widespread over this area, are in diabase and gabbro. None were seen in the clastic rocks in the area mapped.

The map which accompanies this Report shows the distribution of the rocks in the area examined by us.

Character of the Country

The southern part of the area mapped is heavily covered, and includes many acres of swamp and muskeg. In the northern part of the surveyed townships, and in the unsurveyed territory, the country is more rugged. The rock is well exposed in numerous ridges, and around the shores of Wendigo lake.

Geology

The lower levels, at the lake shores and south of lake Wendigo, represent a horizon of greywacké slate. Hills of fragmental rock in this area, rising one hundred to two hundred feet above lake Wendigo, show slate, arkose and coarse conglomerate in ascending order. From the south a great sill of diabase and gabbro, rising very slowly, overlying the greywacké slate, extends northwards, touching lake Wendigo at Wilson's bay.

Classification

Nipissing diabase.	
Cobalt series	Conglomerate, arkose, slate.
Keewatin	Greenstones.

Nipissing Diabase and Gabbro

The nature of the diabase sill is well shown in a number of places. At the foot of cliffs of diabase, the igneous rock is seen to overlie horizontally bedded, slaty greywacké. At the west end of lake Wendigo the slate dips slightly to the south under diabase. This sill structure is seen wherever the contact is exposed. The cooling of the igneous sheet has produced vertical cylindrical columns. These are often well defined in the ridges north of Ingram township, where columns twenty to thirty feet in diameter form the vertical cliffs, while wide cracks mark out the continuation of the column boundary.

To the naked eye the ophitic structure is not often apparent; but under the microscope most of the finer grained specimens were found to have typical diabasic structure. The coarser parts, as in and north of Pense township, do not show this structure. The fine-grained rock on the west shore of Mallard lake is also gabbro.

A typical diabase is that at the outlet of Wendigo lake. This is a dark grey rock showing light colored feldspar and brown augite. Under the microscope the large individuals of augite are seen to enclose lath-shaped feldspar crystals. There are present a few crystals of magnetite and ilmenite and some brown biotite.

A specimen taken from the east shore near the head of lake Wendigo, is coarser in texture. The augite is partially altered to chlorite. There is more ilmenite and also some quartz and pyrite.

At the narrows about two miles from the foot of lake Wendigo there is a pink colored phase of the diabase. This color is due to an abundance of pink feldspar. The

feldspar and augite are both much decomposed, and chlorite and calcite are prominent secondary minerals. Ilmenite, accompanied by the alteration product, leucoxene, is common. A more acid phase of this rock is composed chiefly of orthoclase, with a few crystals of plagioclase and quartz. The pyroxene has a faint violet color, and is probably titaniferous. It decomposes to calcite and chlorite.

The coarser parts of the igneous rock, such as occur on lot 6, in the sixth concession of Pense township, and north of Pense, contain considerable quartz. The quartz is often in graphic intergrowth with pink colored feldspar.

A fine-grained type, on the Le Roy claim, Mallard lake, is composed largely of yellowish-brown pyroxene along with a small proportion of plagioclase feldspar. Chlorite has resulted from alteration of the pyroxene. Magnetite and ilmenite are also present.

Isolated outcrops on the Blanche river, in the neighboring townships of Marter and Evanturel, have been described by W. G. Miller* and W. A. Parks.†

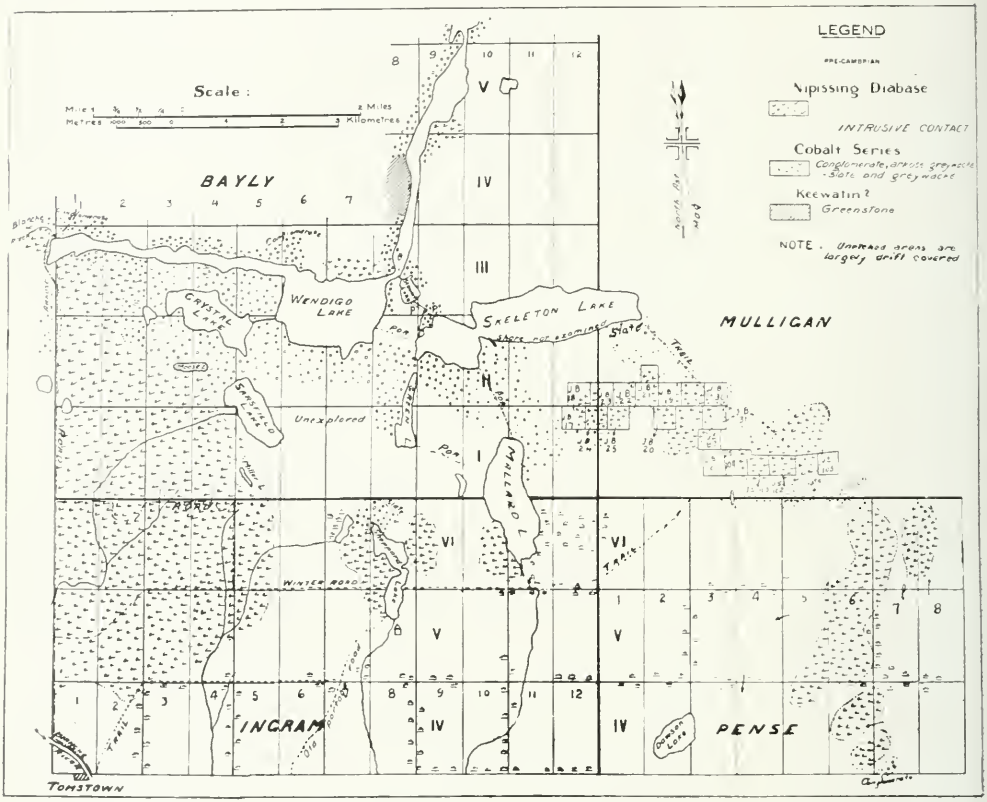

Fig. 62.—Area south of Lake Wendigo.

Cobalt Series

The clastic series may be conveniently divided into three parts: greywacké, arkose and coarse conglomerate. The change from one to another of these is generally by insensible gradations; but in good exposures in cliffs it is possible to define the layers approximately. The order is the same as at the Little Silver Cliff at Cobalt, greywacké slate being the lowest member and conglomerate capping the ridges.

Under the microscope these rocks are found to be quite similar to those of Casey township described in this Report.

*L. Temiskaming to the Height of Land, Annual Report Bureau of Mines, 1902, p. 228.
†From L. Temiskaming Northwards. Summary Report, G. S. C., 1904, p. 214.

A good exposure showing these rocks is in the cliff at the north of Green lake. The arkose layer, here as elsewhere, is only a few feet in thickness. Below the arkose, greywacké is exposed for fifty feet. Above, is a somewhat thicker bed of coarse conglomerate.

There is a rather large area of arkose south of the foot of lake Wendigo. It is a light colored rock composed of quartz and feldspar cut by numerous small stringers of quartz. Some darker phases of the arkose receive their color from chlorite. Similar rock outcrops southeast of Beaver lake.

Underlying the gabbro in the southeast corner of lot 6 in the fifth concession of Pense there are several alternate layers of greywacké and arkose varying in thickness from 4 inches to 3 feet. The greywacké is composed of very small particles which are scarcely distinguishable. The arkose contains a high percentage of chlorite, and is consequently quite dark in color.

Keewatin

On the west shore of the north arm of lake Wendigo there is a series of greenstones which are probably of Keewatin age. These consist largely of pyroxene rocks which have suffered considerable granulation and chemical alteration. A porphyritic phase contains crystals of orthoclase, augite and hornblende in a fine-grained ground mass of the same materials.

As we did not examine the territory north of lake Wendigo, the field relationships of these rocks are not known. From the petrographic characters alone, it seems most likely that they belong to the Keewatin series.

It is noteworthy that in the area mapped south of lake Wendigo, the diabase sheet does not come in contact with rocks of Keewatin age, and in this respect the geology differs from that at Cobalt.

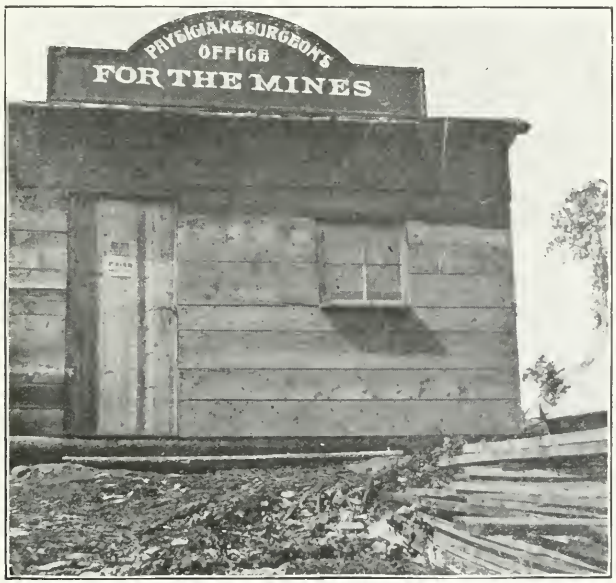

Fig. 62a.—Physician's office, Cobalt, July, 1905.

THE AREA WEST OF BAY LAKE ON THE MONTREAL RIVER

By J. S. DeLury

Introduction

On July 16th, 1906, acting on instructions from Professor Miller, the Provincial Geologist, the writer proceeded from the Government camp, on Giroux lake near Cobalt, to the west side of Bay lake to map out the geological features, and to examine the mineral claims which are staked out there. The area was mapped by Dr. Barlow, of the Dominion Geological Survey, and was included in his Temiskaming and Nipissing map sheets issued in 1899. This map and a blue print made by the Ontario Crown Lands Department from timber and mineral lands surveys, were used as a basis for the topography. In mapping in the geological features, owing to the very limited time in the field at the disposal of the writer (namely, from July 17th to July 31st), distances were paced from exactly surveyed lines such as timber and mineral claim lines; angles were measured with a prismatic compass.*

The area mapped embraces the country bounded on the north and east by Bay lake and the Montreal river, and on the south and west by the Gillies and Booth timber lines (now the western boundary of Coleman township). The country covered by the writer is fairly well wooded, though the best timber has been removed by the lumberman. A good wagon-road runs from the mouth of Trout creek to an old lumber camp on the east end of Trout lake; there are also roads cut out from Trout creek, near its mouth, to several of the mining claims to the south. A portage trail runs westward from about the middle of Bay lake to the extreme eastern end of Anima-Nipissing lake; this, according to Dr. Barlow, was cut out under the directions of Father Paradis, in 1891, to form a winter road from Bay lake to Temagami. Trout creek is the only navigable stream in the area mapped, and only small boats can go up this for a short distance from its mouth.

Glaciation has left its characteristic topography, the country consisting of small valleys and hills which show glacial striations.

Rocks of the Area

The only sediments occurring here are banded slates and quartzites, together with some intermediate rocks. These seem to belong to the Cobalt series, and are a continuation westward of the same rocks mapped by Professor Miller in the Cobalt area, east of Bay lake. In every place where both types of rock could be seen together, they were quite conformable, there being a regular transition from banded slates below to typical white quartzite above; this transition zone, usually of considerable thickness, and made up of rocks intermediate between the slates and quartzites, shows that the banding of the slates is parallel to the bedding of the lower quartzites; these lower bedded quartzites, which are quite impure, pass into white quartzites, and these, on account of their lack of impurities and constant composition, show no bedding planes. These rocks were doubtless deposited as a result of water action over wide areas. None of the old Keewatin formation was positively identified in this section of the country, though on the northwest side of Trout lake, outside of the area mapped, was an exposure of what seemed to be an old Keewatin greenstone.

The only igneous rocks of the area are diabase and gabbro intrusives, which cut the slates and quartzites above mentioned. These rocks come up in the form of narrow dikes, which seem to be near the vertical in position, and in no case has an extensive metamorphism of the sedimentaries resulted from their intrusion. The larger diabase and gabbro dikes have altered a narrow zone of quartzite along the contact; and in many cases small zones (usually less than two yards in width) of autoclastic rocks or friction breccia were formed. In one place in particular (on J S 54) a zone, from two to three yards in width, consisting of compressed fragments of diabase and quartzite, lies between

*The area mapped by Mr. De Lury is now included in the fourth edition of the Cobalt map, scale 1 mile to an inch.

the unaltered intrusive and the typical unaltered quartzite. Along most of the contacts, however, the quartzite has been crumbled for a short distance from the contact, and these fragments having been compressed and cemented together, form a coarser-looking quartzite, which in some cases looks like an igneous rock. This is particularly the case when the quartzite is rather impure. In no place was a contact observed between the slate and the intrusive, so that the metamorphic effects on that rock could not be observed. This is probably owing to the fact that the slate, having been more readily glaciated than the diabase and quartzite, is generally flat and drift covered.

The diabase and gabbro resisted glaciation more than the sedimentaries, and throughout the area stand out in relief from the quartzite as well as from the slates.

The individual rocks will now be briefly described:

Banded Slate

The slates are of the type described by Dr. Barlow and Professor Miller for similar areas in the Temiskaming district; they are of the so-called banded type, showing fine banding of alternating greenish, reddish and dark bands. This pronounced banding indicating the bedding, and higher up the general conformable transition into slaty-bedded quartzites leave no doubt as to the true sedimentary nature of the slate, and indicate that the slates have been deposited as a result of water erosion and deposition over wide areas. Except where they approach the quartzites, they are very fine and even grained, and in no case noticed did they contain any larger fragments of clastic material. The darker and greenish colors are probably due to secondary silicates such as chlorite and the reddish stain of some of the bands is likely caused by the presence of hydrated iron oxide. As the quartzite is approached above, the slate changes into chocolate-colored, fine to medium grained, intermediate rock, which is in most places of considerable thickness.

Quartzite

With the gradual transition from the banded slates below through an intermediate zone of quartzitic slates and slaty-quartzites, the impure quartzite comes in above, and higher up the typical white quartzite. As there is no superior formation the thickness of this quartzite bed could not be ascertained. No quartzite was found consisting of pure quartz though the higher quartzite has a greater percentage of free silica. In all the quartzite is a considerable amount of feldspar and most of it shows small amounts of white mica. As the slate is approached below, the impurities increase, the coloring matter, such as iron oxide and secondary silicates become more prominent and the quartzite becomes gradually darker in color.

A thin section of the whitest quartzite examined under the miscroscope shows the following: The rock is made up of even, rounded grains, the major part being quartz; orthoclase and microcline are in a considerable amount and a little plagioclase can also be seen. This section shows no mica though in many fragments it may be seen without the assistance of a microscope. The quartzite is evidently formed from sandstone by great pressure and some cementation, as some of the quartz fragments show additional secondary silica.

Nipissing Diabase and Gabbro

The exact age of the intrusives could not be ascertained, though from their general appearance and degree of alteration, it is probable that they are the result of the same active period that caused the similar intrusions in the Cobalt area.

The smaller dikes of intrusive rocks are typical diabases, very fine-grained near the contact, and becoming more coarsely grained and more acid as the centre is approached. In the centre of the larger intrusives the rock is more of the gabbro type, being coarser grained and more granitoid in structure than are the edges of the same intrusive and the smaller dike rocks. The diabase and gabbro have undergone some alteration, particularly near the surface; diabase from some of the shafts was quite fresh looking and resembled very closely the diabase of the Cobalt area.

Several thin sections, prepared from fragments taken from the dikes at different distances from the contact, were examined under a microscope. Near the contact the

diabase is fine-grained and considerably altered; the plagioclase is much kaolinized and the ferro-magnesian minerals are almost entirely changed to secondary chlorite and serpentine. Ilmenite, changing into secondary leucoxene, is quite a prominent constituent. As the contact is left, free quartz is noticeable in the section, and at the centre of the larger instrusives a micrographic intergrowth of quartz and orthoclase is quite pronounced. This last probably represents the part of the original magma which was last to cool.

An interesting exposure of porphyritic diabase can be seen on the timber line between V lake and Trout lake. This consists of a typical diabase in which are embedded large phenocrysts of plagioclase some of which are about three inches in length. The exposure is so small that it is mapped as part of the ordinary diabase-gabbro intrusion.

Veins and Mineral Indications

At the time the claims were visited, no great depth had been attained in prospecting; the shafts were sunk on only about five claims, namely, J S 53, J B 33, J B 29, J B 32, and J S 50.

The veins of the area are made up principally of calcite gangue, and near the surface there is cobalt bloom, pyrite, and chalcopyrite. Deeper down in the veins, where shafts have been sunk, occur small quantities of smaltite, and sometimes niccolite. The veins are very irregular and are either altogether in diabase or are on the diabase contacts. Some of the veins, particularly those associated with the smaller dikes, follow through the diabase within a few feet of the contact. In the larger intrusives the veins are most irregular, and run through the diabase with no definite strike or dip. The veins along the small diabase dike near the mouth of Trout Creek, are examples of the former type; in fact, there seems to be a fractured zone following the whole length of the west contact of this dike. The small area of diabase near where the Montreal river widens into Bay lake contains a small stringer of calcite showing chalcopyrite. Of the deposits in the larger bodies of diabase-gabbro, the most important are in J B 33 and J S 53. On J B 53 (the Edison claim) is a network of calcite stringers, some of which approach a foot in width in the larger parts. Cobalt bloom is found at the surface and, deeper down, smaltite is found, though not in paying quantities at the time the property was visited.

In the cases where shafts have been sunk the mineralization seems to increase with depth. In no cases were silver minerals noticed, though low silver assays were claimed on two of the properties. Most of the claims, particularly those not in the diabase, had no lines to their discoveries. As many of these are located on quartzite and as no good indications were observed at any place in that rock it is probable that nothing of importance will develop on these properties.

Unlike the slate-conglomerate near Cobalt, the quartzite does not seem to be fissured. A small fissure in diabase about one mile due north of the extreme east end of Anima-Nipissing lake contains small quantities of stibnite.

The Claims on Whitewater Lake

Three days were spent on a trip through Anima-Nipissing lake to Whitewater lake in the Temagami Forest Reserve to examine certain mineral claims which were staked out there. On the eastern side of the middle enlargement of Anima-Nipissing is a pyrrhotite deposit associated with what seems to be granite rock. It was claimed by the owners that it contained a small percentage of nickel. An exact idea of the importance of the deposit could not be obtained at the time of this examination.

On the claims near Whitewater lake, nothing very valuable was seen, though none of the veins had been developed. Claim T R 2 showed a quartz stringer in diabase holding some chalcopyrite and showing secondary copper stains. T R 6 was the only claim bearing indications of cobalt. There was a little bloom associated with calcite in a small crack in diabase. The other claims examined showed nothing of importance and few of them had lines to their discoveries.

MONTREAL RIVER AND TEMAGAMI FOREST RESERVE

Including Townships of James, Tudhope and Others

By Cyril W. Knight

The third edition of the report was accompanied by a geologically colored map, which included thirty townships, of which the township of James is distant 37 miles northwest of Cobalt. This map is now out of print, but the present edition of the report is accompanied by two black and white maps, Figs. 57, 63, which include the more important areas shown on the colored map.

While much of the surface of the country is similar to that at Cobalt, the southwest part in the vicinity of Anvil lake, includes some comparatively rough country. What is one of the highest hills in Northern Ontario, known as Maple Mountain, occupies parts of the Townships of Banks, Whitson and Rorke. Its elevation has been given as 2,000 feet above sea level. The mountain rises 950 or 1,000 feet (aneroid determination) above Anvil lake. The ascent is readily made along the surveyed line of the south boundary of Whitson, and there are few places in Northern Ontario from which a better view may be obtained. The country to the west of the mountain is much more rugged than is that to the east.

ROCKS OF THE AREA

The rocks have been divided according to the following scheme of classification:

Glacial and Post Glacial

Boulder clay, sand, gravel, clay.

Great Unconformity

Pre-Cambrian

Keweenawan

Nipissing diabase and gabbro.

Igneous Contact

Cobalt Series

Arkose, quartzite, conglomerate, greywacké and greywacké slate.

Great Unconformity

Laurentian

Granite, syenite and gneiss. These rocks are older than the Cobalt series, but their relation to the Temiskaming series is not known.

Igneous Contact

Keewatin

Altered greenstones.

Keewatin. The only areas of Keewatin greenstone met with were in the township of Tudhope. On lot seven, concession three, the rock is in places a rather coarse amphibolite, consisting almost wholly of green hornblende, occurring for the most part in grains about one-eighth of an inch in diameter, and also in fibrous masses.

*Report of Canadian Geological Survey, 1897, pp. 22 T, 26S T.

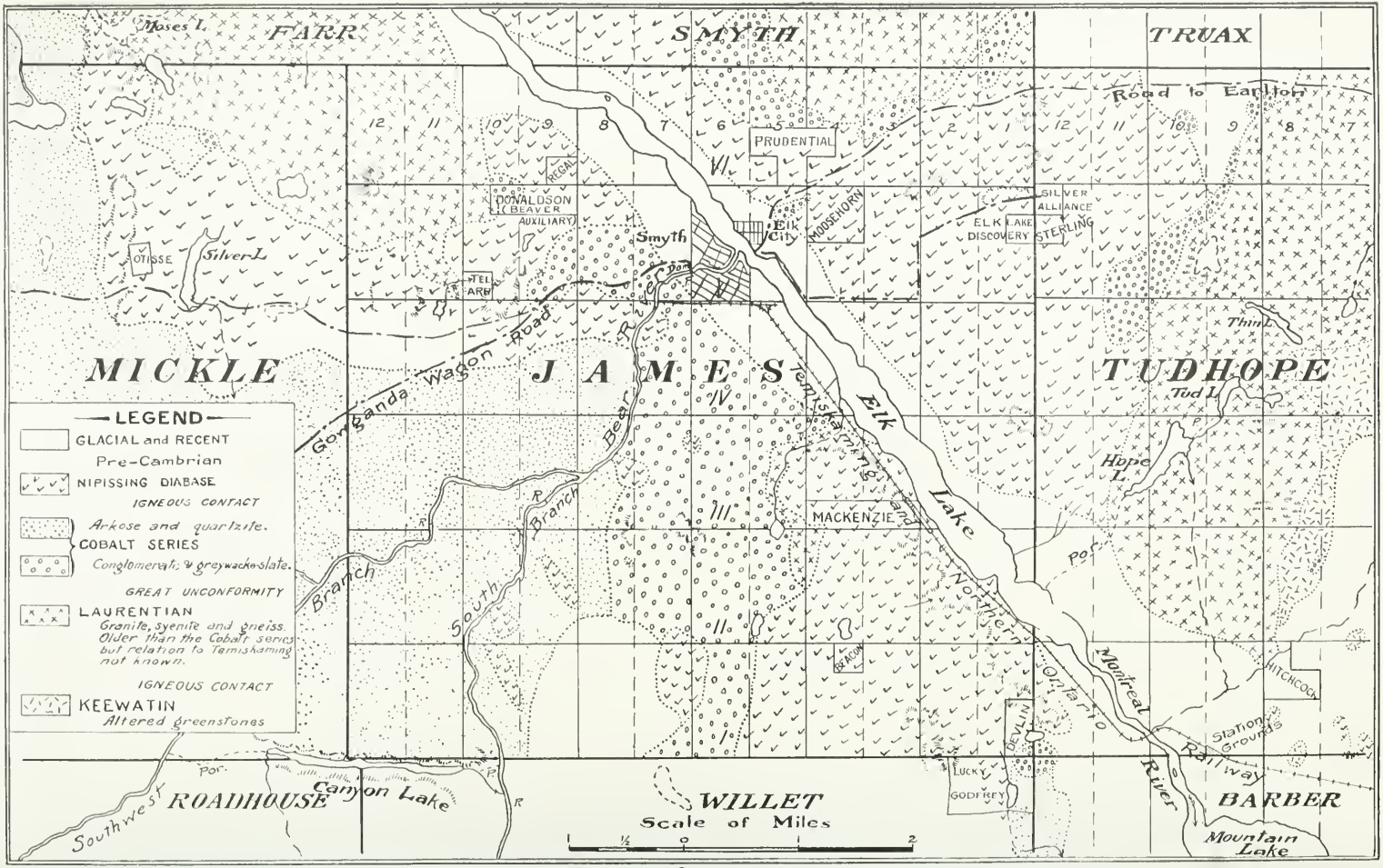

Fig. 63.—Area adjacent to Elk lake, Montreal river.

Small amounts of epidote and quartz are also present. In other places it is a dark, grayish green, fine-grained variety, which under the microscope is seen to consist mainly of small rods and irregular grains of green hornblende, together with allotriomorphic grains of twinned (and untwinned) feldspar, epidote, quartz and chlorite.

Torsion cracks are met with in places but they are not as large as those generally seen in the Cobalt area. Good examples of what is known as "ellipsoidal structure" are seen, especially on one outcrop in the centre of the square mile formed by lots seven and eight, concession three, Tudhope. The jasper-iron formation, characteristic of the Keewatin, was not met with.

Laurentian (?) The rocks classed under this head consist of coarse-grained granite, granite gneiss and syenite gneiss, many exposures of which are seen in the township of Smyth. The relationship to the Keewatin is splendidly seen on the north

Fig. 64.—Looking southwest from the top of Maple mountain, Township of Rorke, thirty miles west of the town of Cobalt.

half of the lot line between lots seven and eight, concession three, township of Tudhope. The granite here is a uniform, coarse-grained, pink variety, similar to that exposed about four miles to the west on lots four and five, concessions two and three, James township. It clearly invades the greenstone, and thousands of granite dikes from a foot or more down to a fraction of an inch are found ramifying in all directions through the greenstone. The light color of these dikes contrasts strongly with the dark green Keewatin. Angular fragments of greenstone have been caught up and included in the Laurentian. The mineral epidote, with its peculiar yellowish-green (sometimes called pistachio-green) color has been developed in the greenstone at its contact with the granite.

These granitic rocks are older than the Cobalt series, but their relation to the Temiskaming series, which is not exposed in the area, is not known. The granite may therefore be of the same age as that known as Lorrain.

Cobalt series. The Cobalt series consists of (1) conglomerate, greywacké and

greywacké slate; (2) arkose and quartzite. The conglomerate, greywacké, etc., of group (1) is exposed in many places in James township, and the arkose and quartzite are seen on Maple mountain. Both groups of rocks are similar to those in the Cobalt area proper, and in Lorrain township, but in the Montreal river area an unconformity has not been discovered between the two groups. In rare cases the arkose and quartzite become conglomeratic owing to the presence of white quartz pebbles.

Relation Between Cobalt Series and Granite

The unconformity between the granite and conglomerate is exposed on lots 4 and 5 in the second and third concessions of James township, on the east shore of "Deserted" lake. At the contact the conglomerate holds pebbles which are exactly similar to the underlying granite. The unconformity is very clear.

Diabase and Gabbro. These rocks are economically the most important in the area under review, because the cobalt-silver veins occur in them. Their exact age is not known, but where their contacts with the other rocks have been met with they are seen to penetrate them, and are therefore the youngest series in the field. Like similar rocks at Cobalt, the Nipissing diabase, they appear to be in the form of sheets or sills, and we saw no evidence of surface flows. At the southwest corner of lot ten, concession five, James township, there is a small area of quartzite or arkose. It lies at the foot of a diabase hill which showed a height of 120 feet by aneroid barometer. The diabase overlies this fragmental material. The actual contact is 450 feet east of the northwest corner of the northwest quarter of the north half of lot ten, concession four. The arkose floor upon which the diabase rests dips gently to the southeast, and it may be traced south of the concession line for about a hundred feet. At the immediate contact the two series have been fused together but otherwise the arkose does not appear to have been altered. The structural relationships here appear to show that the diabase is in the form of a sheet.

Other contacts with the diabase are as follows: On the southwest quarter of the north half of lot ten, concession five, James township, it is seen to invade the Laurentian gneiss. At the southeast corner of the northeast quarter of the north half of lot five, concession three, James township, it also invades the granite. On the northwest quarter, north half, lot four, concession five, James township it is seen to be younger than the Cobalt series. On the west shore of a small lake known as Beaver, in the township of VanNostrand, the diabase is seen to be younger than the quartzite. The latter, however, in this case overlies it.

The Nipissing diabase of the Montreal river presents somewhat greater variety than that of the silver area at Cobalt. It is usually medium in grain, but varies from fine grained types to those in which some of the pyroxene individuals are an inch in length. In some cases it shows very marked magmatic differentiation, that is to say it may pass into more acid types, having the chemical composition of syenite or even granite. An example of the latter is seen on the north end of Darby lake, township of Whitson. Frequently a pink feldspar develops which gives the rock a reddish appearance. Sometimes this feldspar is present in large amount. Such a facies occurs on White Bros.' mining claim (T R 207), township of Whitson. A thin section of the latter showed the rock to consist of an acid plagioclase and hornblende, together with a little augite, quartz, titanite and ilmenite. The feldspar is nearly all striated, and shows extinction angles under 15 degrees. Mr. A. G. Burrows separated this pink plagioclase from the rock and analyzed it with the following result:

SiO_2	67.76
Al_2O_3	17.86
CaO	2.37
MgO	.27
K_2O	2.48
Na_2O	6.87
FeO	1.6
	99.21

Regarding the variety of this feldspar, Mr. Burrows says: "The high per cent. of silica would indicate albite, and there is also very likely a little orthoclase, as I noticed there seemed to be a very slight difference in the reddish portion of the sample, some parts being pinker than others. The alumina seems low for an albite and quite low for an oligoclase-albite, but it may be partially replaced by iron oxide. I simply calculated all the iron to ferrous oxide."

In other instances the diabase series carries quartz in micrographic intergrowth with feldspar, resulting in a quartz-diabase. Such an example is found at the southwest corner of lot four, concession six, James township. It consists essentially of plagioclase, augite and micrographic intergrowths of quartz and feldspar. The plagioclase occurs in rods and stout prisms, and the ophitic texture is marked. The augite is pale brown and non-pleochroic, and has partly altered to green fibrous hornblende and chlorite. The micrographic intergrowths of quartz and feldspar crystallized out last. On the lot immediately to the south the rock is also a quartz-diabase.

On the west shore of Bergeron lake, township of VanNostrand, there is an interesting dike cutting the quartzite series. Its position is indicated on the map. It begins at the northeast corner of J S 163, and can be traced northwest a quarter of a mile, showing a width of 75 feet. It is coarsely porphyritic, the phenocrysts of plagioclase sometimes having a length of two inches. Under the microscope the ground mass is seen to be made up of rods of plagioclase, pale brown augite, olivine and magnetite (or ilmenite). The texture of this ground mass is distinctly ophitic. The dike is a porphyritic-olivine-diabase.

We found a similar rock on the southeast end of Kerry lake, township of Van Nostrand.

Glacial and Post-Glacial. Boulder clay, sands, gravels and clays cover much of the area. The glacial striæ on top of Maple mountain are from 1 to 15 degrees west of north, whereas on lower altitudes they are usually some degrees east of north.

Notes on Veins

The silver and cobalt bearing deposits, all of which are found in the diabase, may be divided into two types, of which the first mentioned predominates, but has not proved to be of economic importance: (1) aplite dikes; (2) calcite veins. It would appear that there is no hard and fast line of division between the two types. The aplite dikes have the composition of granite, but are finer in grain and contain few colored constituents, like mica or hornblende, etc. A thin section from a dike in Smyth township (southwest quarter, south half, lot eight, concession two) was studied under the microscope. It is seen to consist of irregular grains of quartz and feldspar. A few grains of epidote occur. A small amount of calcite is present; this is seen to be younger than the other parts of the dike, because it occurs in cracks and ramifies between the grains of the quartz and feldspar. A vein on the Currie claim, on Hubert lake, township of Farr, also shows that the calcite is later than the quartz or feldspar. It is possible that this relationship does not always hold. On the shores of Silver lake, township of Mickle, the calcite in some of the veins was deposited later than the quartz. The latter has crystallized in prisms more or less at right angles to the walls of the crack and calcite has later on come in, together with certain copper sulphides (bornite and chalcopyrite). Native silver when present was probably deposited with the calcite. Thin sections from other aplites in Tudhope and Farr sometimes show quartz and feldspar in micrographic intergrowth. Chlorite is also sometimes present, apparently secondary after some ferro-magnesian constituent.

These aplite dikes are supposed to have been formed by cracks appearing in the diabase as it cooled and contracted; they were subsequently filled with vein or dike material, which probably came from hot solutions (aqueo-igneous) given off by parts of the diabase still molten. Small scales of native silver occur frequently in the aplites.

(It is interesting to know that veins or dikes carrying cobalt, somewhat similar to those of the aplite of the Montreal river area, are found in South Africa. The geolo-

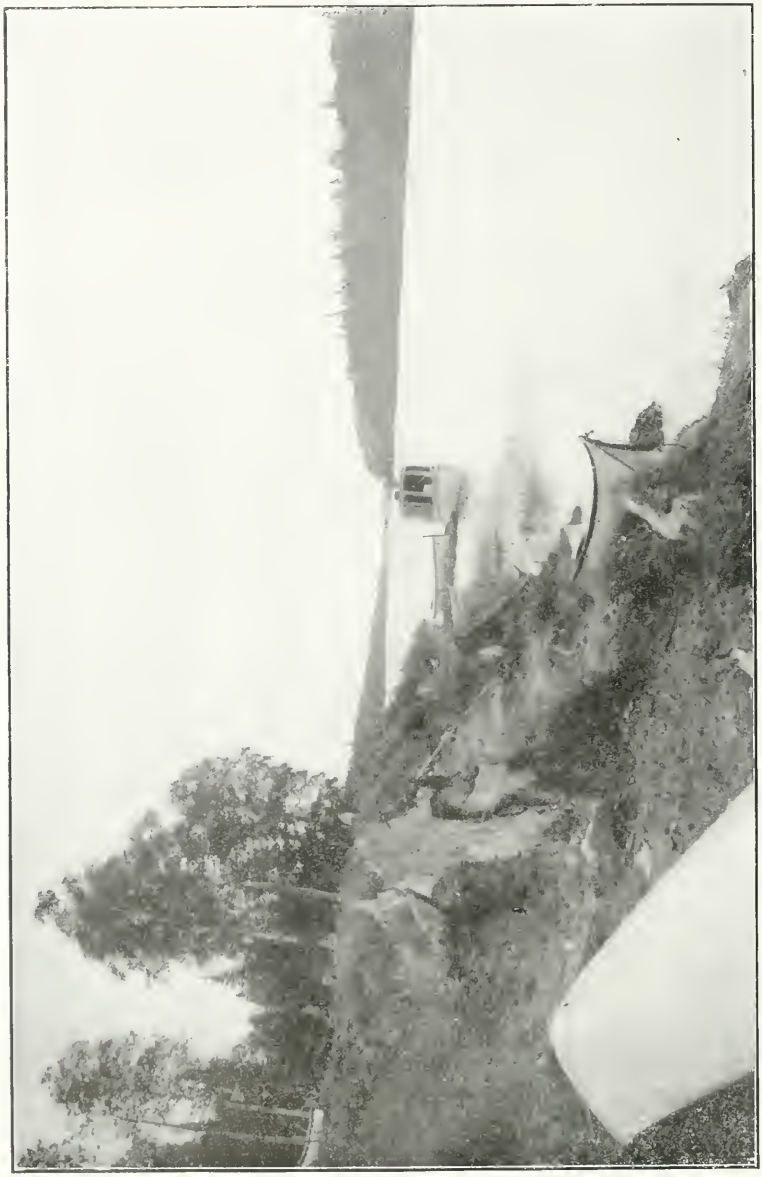

Fig. 65.—A stretch of Montreal river, Elk lake.

gists who have studied these veins or dikes in both Ontario and South Africa have come independently to the conclusion that they are probably of igneous origin. A brief description of the South African veins is given on a following page. W. G. M.)

Most of the calcite veins (type 2) are similar to the veins at Cobalt, save that the former sometimes contain the mineral barite, which is not known to occur at Cobalt.

The development work performed on the properties at Elk lake up to the end of the year 1907 was not extensive, but if information is desired on this point it will be found in the sixteenth Report of the Bureau of Mines, pages 125-127. Since that year work has been carried on at various times on several properties, concerning which the following notes have been taken from information supplied by Messrs. E. T. Corkill and A. G. Burrows.

At several properties where there were good surface showings the underground development did not show workable deposits. A discovery in 1912 of a vein on the Donaldson property, James township, near the 100-foot level, which carries high-grade silver ore, has revived interest in this section, while the construction of the branch line of the T. & N. O. railway to Elk lake will facilitate the development on several claims on which to the present very little work has been done.

Donaldson

This property is situated on the N.E. ¼ of the N. ½ of lot 9 in the fourth concession of James township. A number of calcite veins have been located and several pits have been sunk. On No. 4 vein, which strikes nearly north and south and dips steeply to the west, a shaft has been sunk to a depth of 150 feet. This vein consisted of calcite, with copper pyrites and specular iron ore, in which some silver values have been reported on assay. This vein dipped from the shaft at 90 feet, and another vein two inches wide, which contained smaltite and native silver, came in on the east side of the shaft, and was followed to the 150-foot level with short drifts at 100 and 150 feet. Some high-grade ore was taken out and bagged during this development. A main working shaft is now being sunk 50 feet west of No. 4 vein, and to the south of No. 2 a cross vein from No. 4. The property was being equipped with two 80-h.p. boilers, an 8 x 10 hoist and one-half of a 16-drill compressor.

Regal

The Regal adjoins the Donaldson to the north. Here two shafts have been sunk on calcite veins. The northerly one had been sunk 120 feet on the inclination of the vein. The intention was to sink to the 150-foot level and cross-cut to other veins which showed on the surface. At this property there is a 40-h.p. boiler and a 6 x 8 hoist.

Moose Horn

At this property some development work was being done on the south part of the group of four claims. The mining development has been described in recent reports by Mr. E. T. Corkill in Bureau of Mines' Reports.

Prudential

A shaft was being sunk on this property near the Moose Horn line. It was down 30 feet on an aplite dike, which had been reopened, with the formation of a smaltite vein. Where exposed at the bottom of the shaft the smaltite vein was about one inch wide, with an inch of aplite on either side. The smaltite carries variable percentages of silver. Some ore had been bagged during this development.

Beacon

At this property a shaft had been sunk to the 200-foot level, and a cross-cut was being run to intersect an E. and W. vein which showed on the surface.

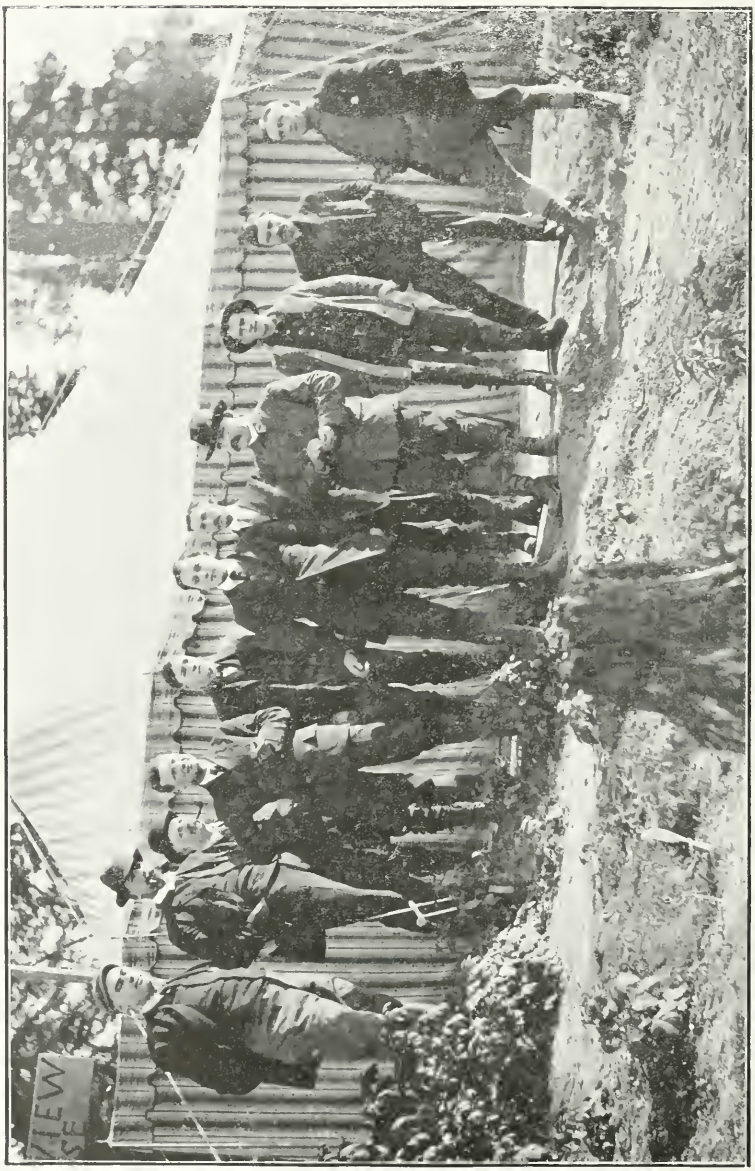

Fig. 66.—A group at Elk Lake, October, 1907.

White Reserve Mines

In 1909 there were shipped from this property 6½ tons of ore.

Mackenzie

At the Mackenzie a shaft has been sunk 60 feet, with a cross-cut to the southwest. There were two veins which dipped to the northeast in the shaft. The cross-cut was made to intersect a vein which showed on the surface 35 feet from the shaft. This vein strikes N. 29° W., dips to the east, and has been developed by a shaft 30 feet deep and a long open cut and trench. The vein material is banded, consisting of aplite, with white and grey bands of calcite carrying copper pyrites. Native silver in small scales has been obtained in the vein of grey calcite. A number of veins occur on the property but most of them are undeveloped. An eight-inch basalt dike cuts the sill diabase and veins at the workings.

Auld Township

Native silver has been found in Auld township on the east side of the Montreal river. A great part of the township is drift-covered, but to the east of the river there is a diabase ridge which has a north and south extension. On the Hitchcock location (S. ½, lot 3, con. VI) there is a number of narrow east and west veins, in some of which native silver, with some smaltite and bloom, has been found. The wall rock of the veins is usually aplitic. On the westerly side of the easterly diabase ridge native silver occurs at two points in fairly coarse dendritic form. At the northerly exposure there is coarse-grained reddish aplite which is heavily stained with bloom. The aplite has more the character of a differentiation of the diabase than a clearly defined dike. At the other exposure where silver was seen there is a grey aplite, along one perpendicular surface of which there is native silver in dendritic form.

A similar occurrence was noted on the Bradley location (S. ½, lot 5, con. IV) which is on the west shore of Lepha lake.

The locality is easily reached from the Montreal river. Lepha lake is three-quarters of a mile east of the south bay of Indian lake, which is an expansion of the Montreal river.

Fig. 67.—Elk City, James Township, summer of 1907.

Fig. 68.—Prospectors, with outfit, travelling up Montreal river, March, 1907.

THE GOWGANDA SILVER AREA*

By A. G. Burrows

The Gowganda silver area is situated in the Temagami Forest Reserve. Gowganda lake, which is the centre of the area, is 27 miles west of Elk lake. The latter is 40 miles northwest of Cobalt.

Owing to the distance from railways, the transportation problem has been a difficult one. During the open season the area was usually reached by steamboat from Latchford on the T. & N. O. railway, to Elk lake, and thence westerly over a wagon road to Gowganda, the journey occupying two days. During the past year a branch of the T. & N. O. railway has been constructed from Earlton to Elk lake.

Gowganda lake is the natural centre of the mining area, being within easy distance of the principal mines and prospects. A townsite known as Gowganda has been established on Bankers' bay, at the northeast end of the lake. It was partly destroyed by

Fig. 69.—The Post Office, Gowganda, April, 1909.

fire two years ago and has only been partially rebuilt. Several gasoline boats make regular trips on Gowganda lake.

Gowganda first attracted attention in the fall of 1908, when the discoveries on the Mann and Reeve Dobie became known. Prior to this, discoveries of silver had been made in the vicinity of Miller lake, on the Blackburn (Millerett) and Gates (Miller lake-O'Brien) claims.

The prospecting in the Montreal river area, which includes Gowganda, consisted in searching for areas of diabase, which appeared to be similar to the diabase exposed at Cobalt. These diabase areas occur at numerous places for many miles from Cobalt, and in a few instances workable deposits of silver ore have been found. It has not yet been shown whether these outlying diabase areas are parts of the sill exposed at Cobalt or whether they are parts of other sills which were formed at the same time as the Cobalt sill. Undoubtedly all the sill diabase outcrops can be considered to be of the same age.

*This report on the Gowganda area may be considered to be the second edition of that which was published with Part II. of the 18th Report of the Ontario Bureau of Mines. A colored geological map of the area accompanies this volume.

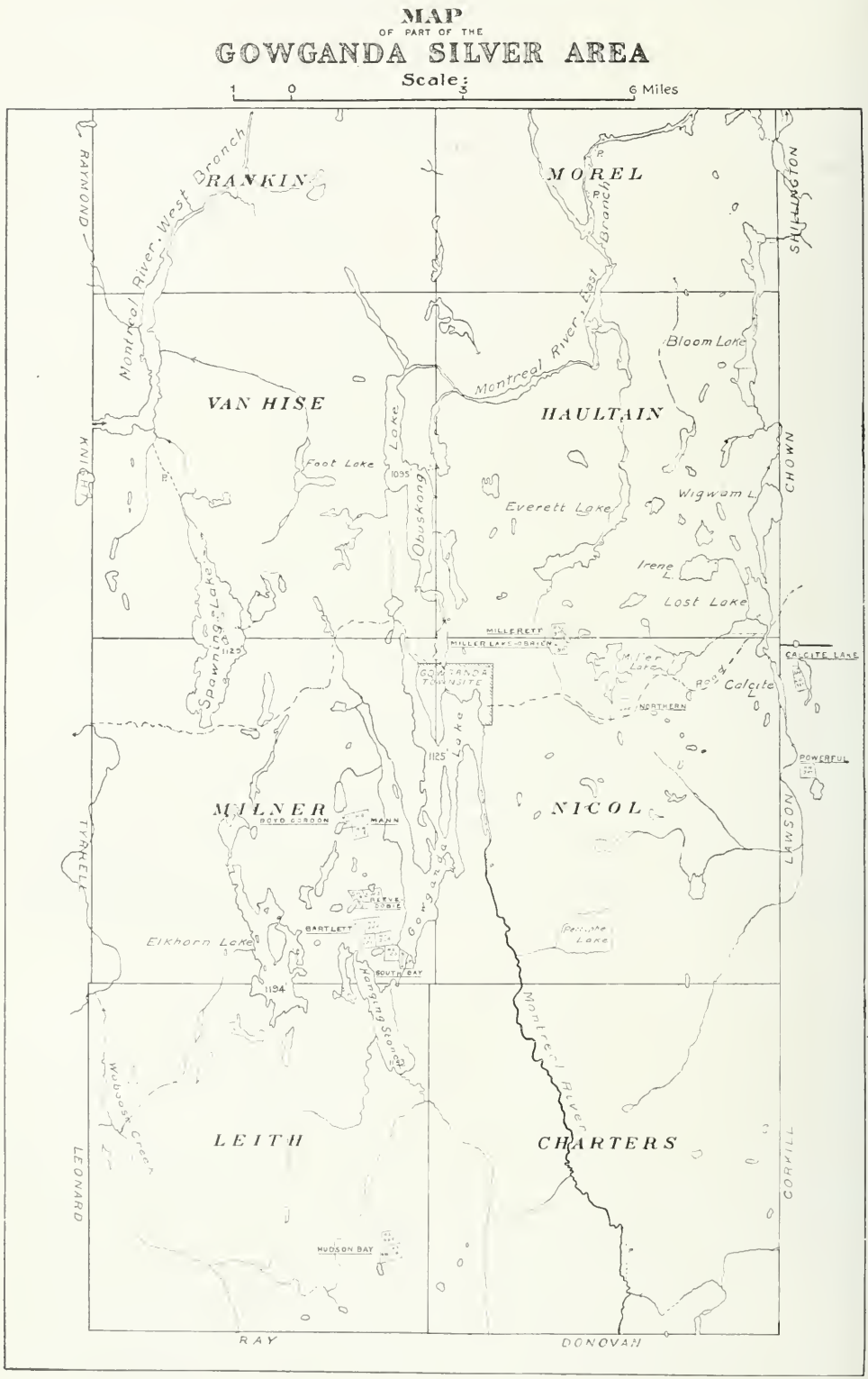
MAP
OF PART OF THE
GOWGANDA SILVER AREA
Scale:
1 0 3 6 Miles
RAYMOND
RANKIN
Montreal River, West Branch
MOREL
Montreal River, East Branch
SHILLINGTON
Bloom Lake
VAN HISE
Montreal River
HAULTAIN
KING
Foot Lake
1035
Obuskong Lake
CHOWN
Everett Lake
Wigwam L.
Irene L.
Lost Lake
Spawning Lake
1125
MILLERETT
MILLER LAKE-O'BRIEN
Miller Lake
CALCITE LAKE
Calcite
GOWGANDA TOWNSITE
NORTHERN
1125
Lake
POWERFUL
MILNER
BOYD GORDON
MANN
NICOL
TYRRELL
LAWSON
Gowganda
REEVE
DOBIE
Elkhorn Lake
BARTLETT
SOUTH BAY
Peninsula Lake
1184
Harding Scott
Montreal River
Wabosoos Creek
LEITH
CHARTERS
LEONARD
CORHILL
HUDSON BAY
RAY
DONOVAN

Fig. 70.

Fig. 71.—South end of Long Point lake, from government road—elevation, 1,040 feet.

Fig. 72.—Dog team on Gowganda lake.

The older rocks, which at Cobalt contain the great number of productive veins, have not up to the present time proved of great economic importance in the Montreal river area. The greater part of the production of the Millerett mine, however, has come from the conglomerate overlying the diabase sill.

Topography

The general character of the surface of the country is quite similar to that of other portions of northern Ontario which has been scored by recent glaciation. Viewed from hilltops the surrounding horizon presents a series of gentle undulations, with here and there a break or prominent hill. In detail, however, the surface is very rough and broken and different geological formations present some differences in surface contour. Rocky ridges alternate with swampy depressions abounding in small, swampy lakes, in much of the area. The larger lakes usually have considerable rocky shore line and are quite clear.

Generally the longer axes of the lakes are north and south, as this is the prevailing direction of the ridges. This north and south trend is particularly noticeable in the diabase occurrences and the general configuration of the country would seem to date from pre-Cambrian times. The waters of this area flow northward and there is a marked parallelism in the lake systems.

The most prominent features are the diabase, conglomerate and greywacké ridges, whereas the Laurentian and Keewatin generally occur as low rounded hills. The highest elevation was obtained to the southwest of Spawning lake in the greywacké range, which is 400 feet above the general level, or about 1,550 feet above sea level. The conglomerate hill to the northeast of Obushkong lake is 200 feet high and the diabase ridge on the long point in Gowganda lake is also 200 feet at its highest. Gowganda lake is about 1,125 feet above sea level.

Glaciation

The marks of glaciation, varying from fine striæ to broad grooves or rounded hummocks, are evident at many points. The ice mass moved about due south in this area Immediately west of Myrtle lake the glacial striæ are S. 10° E. Mag. and about three miles south on the Crawford claim, H S 339, they are S. 2° W. Mag.

Superficial Deposits

The superficial deposits consist chiefly of sandy loam, sand and gravel. The area lies a short distance south of the southerly limit of the northern Ontario clay belt. Very little of the soil would be suitable for agriculture except in small patches. Jack pine plains and rolling sand ridges are characteristic of much of the south part of the area, while spruce and dead tamarac swamps form a considerable part of the northeast part of Leith. The timber is chiefly white and black spruce, birch, balsam, jack pine and poplar. Red and white pine are seen in small groves in isolated parts. Around Gowganda lake the timber is generally small, but to the south in Leith and Charters there is timber of good commercial size.

In 1908 forest fires destroyed a large tract of timber along the east side of Charters, Nicol and Haultain, and west of Obushkong lake in Van Hise. Small patches have also been burned throughout the area.

ROCKS OF THE AREA

All the rocks of this area may be referred to the pre-Cambrian division and correspond to the scheme of succession as worked out by W. G. Miller in the Cobalt area. They may be tabulated as follows:

Nipissing Diabase

Igneous Contact

Fig. 73.—View from high hill to the northeast of Obushkong lake, showing Davidson and Obushkong lakes.

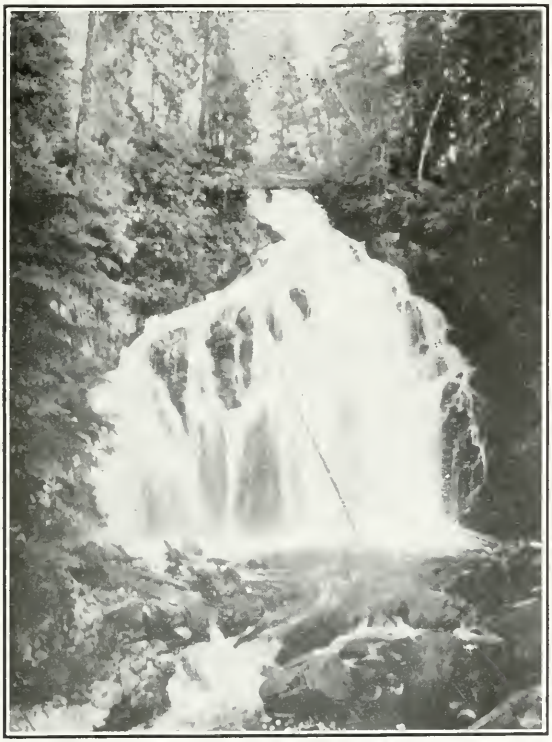

Fig. 74.—Bridal Veil Falls, east branch, Waboose creek.

Cobalt Series

Quartzite, arkose, upper conglomerate, greywacké-slate, quartzite, lower conglomerate.

Great Unconformity

Laurentian

Syenite and granite, intrusive into the Keewatin but not into the Cobalt series.

Igneous Contact

Keewatin

An igneous complex, consisting chiefly of altered basic igneous rocks with some light-colored intrusives and iron formation.

The Temiskaming series, which occurs at Cobalt and Porcupine, was not recognized in the area shown on the accompanying map, but rocks belonging to this series were observed in Midlothian township, 18 miles northwest of Gowganda lake, by James G. MacMillan.*

The oldest rocks comprise essentially the greenstones and green schists of the Keewatin. They show evidence of being largely altered basic igneous rocks. These have been much intruded by light-colored or acid dikes, which have also been much metamorphosed, and now show as bands in the darker rocks. In parts of the area these light-colored rocks are in excess of the other varieties. Bands of iron formation occur at isolated points to the west of Elkhorn and northwest of Gowganda. All of these types have been intruded by late basic dikes, some of which may correspond to the Nipissing diabase.

The Keewatin rocks are both massive and schistose. Where banded or schistose they are always highly tilted. Sometimes they are highly fissile and again platy, breaking in flat fragments an inch or so in thickness. Where these are very fine-grained, they may be distinguished by their steep, almost vertical, dip from similar appearing rocks in the Cobalt series, which for this area have a low dip. Spheroidal weathering in greenstone was observed to the east of Foot lake in Van Hise township.

The prevailing strike of the Keewatin schists is east and west, and in this direction they are often crumpled or folded.

Some Types of Keewatin

A greenish weathering massive rock occurs to the north of Miller lake. A section of a sample from the south line of R S C 87 is altered to scaly and fibrous green hornblende and may be called an amphibolite. To the east of the lake there is much hornblende and chlorite schist.

To the west of Leroy lake the greenstone is much altered and has a dull green, mottled appearance when freshly broken. A section shows much chlorite, epidote, in grains or veinlets, fibrous hornblende and other secondary minerals. This rock, which is rather massive, passes to the west into schist, striking N. 65° E. and dipping 70° N.

About three-quarters of a mile south of Leroy lake some of the rock is an altered porphyry, much sheared and schistose in part. Under the microscope it proves to be an altered feldspar porphyry. The phenocrysts of feldspar are much crushed, and occur in a groundmass of granular quartz and feldspar. To the west of the porphyry is a belt of fissile chlorite schist, much intersected by small veinlets of white quartz.

Hornblende schists and amphibolite occur to the south of Cartwright's camp on Everett lake. Part of the rock is banded, breaking in plates. A section shows green fibrous hornblende the predominating mineral, with grains of zoisite, epidote and a little chlorite.

*Report of Chief Engineer, T. & N. O. Railway, 1910-1911. *See* Chap. I.

West of Obushkong lake there is considerable hornblende schist and associated serpentine rock, which is much weathered to a rusty brown color. In thin section it appears to be chiefly serpentine, with a separation of magnetite. A meshlike arrangement of highly polarizing minerals, in part fibreus hornblende, surrounds the serpentine. The origin of the serpentine was not determined. Serpentine rocks also occur to the north of Serpentine lake and are described by Mr. W. H. Collins as an alteration from olivine rocks.

Immediately to the southeast of Dinny lake is a hornblende rock which is cut up by small veinlets of actinolite. A section of the rock shows alternate bands of fibrous green hornblende and colorless serpentinous material. To the east of this, on the north line of H R 256, the formation is largely serpentine.

A light-colored acid rock is interbanded with the greenstone to the west of Obushkong lake. It is very fine-grained in appearance, consisting largely of crushed quartz and feldspar, with glistening scales of white mica. The dark mineral is chlorite, which is drawn out in fine lines and gives a gneissic texture to the rock.

Fig. 75.—Keewatin (K) intruded by diabase (D) east of Cartwright's camp, Everett lake.

On W J 15, one of the Leroy group of claims near Leroy lake, a diamond drill hole was put down at an angle of 67 degrees. This passed through quartz diabase of various grain, but uniformly dark-colored, for 485 feet, when it passed into Keewatin and was continued for 12 feet. The Keewatin is a fine-grained greenstone, which under the microscope proves to be an altered diabase, as the ophitic texture of the diabase may still be discerned.

Iron formation occurs to the west of Elkhorn lake, along the boundary line of Milner and Leith, showing as bands of red jaspilyte. The ore, which is very lean, is specular hematite and magnetite. The bands are only a few inches to a few feet wide and are associated with an amygdaloidal trap, which represents the lava from an old Keewatin eruption. The vesicles of the original lava are now filled with later minerals, the most abundant of which are quartz, calcite and epidote. Under the microscope the flow structure of the rock is beautifully shown in the somewhat parallel arrangement of the minute rods of plagioclase feldspar.

Another band occurs to the northeast of Gowganda on the Cryderman claim, W D 962. Here the formation is alternately lean magnetite and dark grey siliceous bands. No commercial ore was seen at any of the outcrops.

Dikes in the Keewatin

North of Brett lake are several narrow dikes of a reddish brown lamprophyre. The phenocrysts are augite set in a groundmass of feldspar and scales of fibrous hornblende. Calcite, in grains and veinlets, is also seen.

To the east of the same lake are diabase dikes which are rather fresh looking and may correspond with the typical sill diabase of the area. A section from one of these dikes shows plagioclase feldspar and hornblende as the chief constituents, with some grains of epidote, and magnetite altering to leucoxene.

Fig. 76.—Iron formation (1) intruded by quartz porphyry (P) on mining claim W. D. 962. Northeast of Gowganda.

To the northeast of Gowganda lake, occurring over a number of claims and much intermingled with green schist and iron formation, is a whitish and reddish porphyry, which in part has well marked phenocrysts of quartz and again is felsitic in appearance. A section of a sample from the south line of R S C 123 shows most of the phenocrysts to be quartz which have corroded outlines and are partially crushed. Some ragged outlines of plagioclase are also seen. The groundmass is granular quartz and feldspar with a little chlorite. Much of the rock is quartz porphyry. It intrudes the green schists and iron formation and may be of Laurentian age. In this area the green schists, porphyry and iron formation are much confused and all are cut by narrow dikes of diabase, so that a division of the different formations was impossible.

Crushed Syenite

Along the east shore of Dinny lake and at points to the north end of Davidson lake is a narrow fringe of a reddish rock, hardly a chain wide in any place, which

under the microscope appears to be a badly crushed syenite. It may have been a dike which later became a fault plane which granulated the rock. A sample of a coarse variety east of Dinny lake is largely plagioclase and orthoclase, badly crushed with many cleavage cracks and showing wavy extinction. Throughout the whole mass are veinlets of chlorite and epidote.

Laurentian

Probably the most of the rocks here classed, for convenience, as Laurentian are of similar age to the Lorrain granite of Cobalt. They are largely flesh-colored and grey granites and syenites, grading into each other. There is a tendency in small areas to pass into gneiss, but this structure is only evidenced by the drawing out of constituents in lines. The rock has not been subjected to folding and intense metamorphism seen in other localities. The most common variety is a hornblende granite,

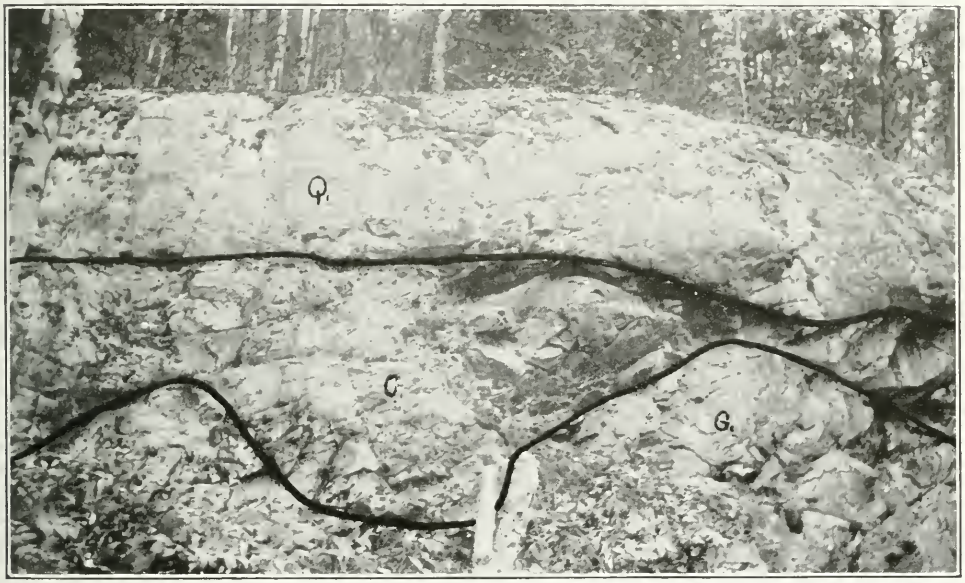

Fig. 77.—Contact of Laurentian and Cobalt series, east shore of Bloom lake. (G) granite, (C) angular and rounded fragments of granite, (Q) quartzite.

generally pink or flesh-colored. A section of a sample from west of Bloom lake is a hypidiomorphic mixture of quartz, feldspar (orthoclase and acid plagioclase) and green hornblende, with a little sphene, apatite and magnetite as accessory minerals. This rock may be traced to the southwest, where it gradually passes into a hornblende syenite, around Everett lake, and extending west to Davidson lake. It intrudes the Keewatin at many points to the west of Everett lake and near Cartwright's camp. Another common variety is a grey biotite granite, which is intermingled with the hornblende granite.

A porphyritic syenite occurs to the northeast of Wilson lake. Where it approaches the basic Keewatin rocks, it becomes darker in color with blotches of basic material which have been absorbed from the Keewatin. The porphyritic character is well marked on the weathered surface where the feldspar has been bleached out. In thin section much of the feldspar is idiomorphic and has a zonal structure due to the regular arrangement of included minerals. The ferromagnesian minerals are green hornblende and a little biotite altering to chlorite. Quartz is present in small grains.

Cobalt Series

This series covers a large part of the area and presents a great number of types of rocks. There is often a gradation from a fine-grained slate to a quartzite or conglomerate and a separation is difficult. These rocks have been little changed since their deposition. No secondary cleavage has been developed and the parting in the slaty varieties corresponds to the stratification.

Greywacké, in part quartzitic, occurs over most of the west parts of Leith, Milner and Van Hise. Conglomerates are seen along the west shore of Gowganda lake, on the long point of the lake, and at frequent points to the east of the lake.

Typical arkose and quartzite are well developed along the east and southwest shores of Obushkong lake and in the valley stretching southward to Gowganda lake. They include most of the township of Charters and the eastern part of Nicol and also

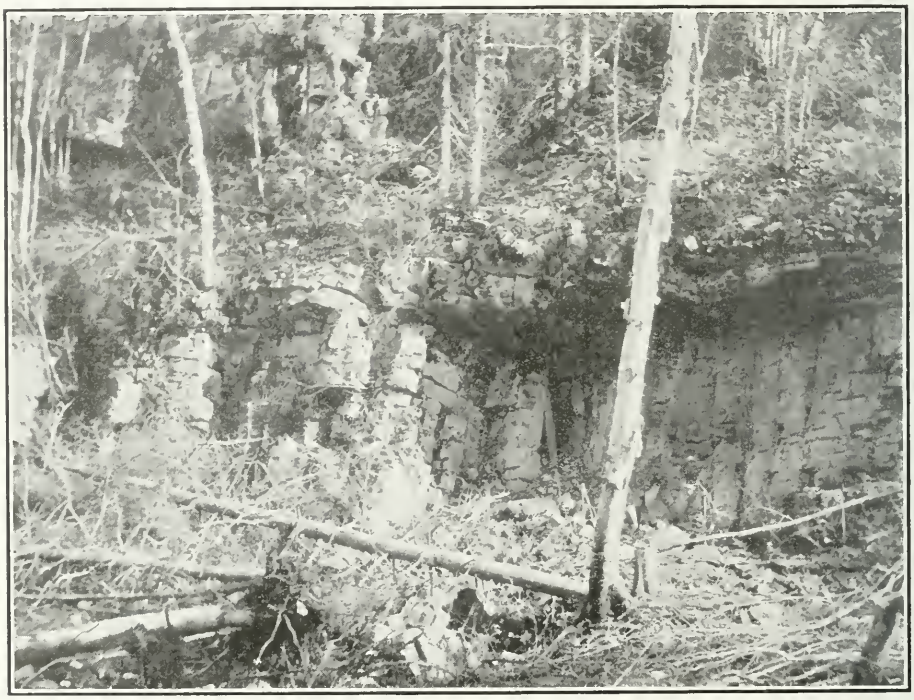

Fig. 78.—Banded slaty greywacké overlain by brecciated greywacké, with easterly dip. Southwest of Myrtle lake.

the large island in Gowganda lake. This series of rock is generally coarse-grained and thick bedded, so that its dip is not easily recognized.

Finely banded slate-like greywacké occurs to the southeast of Myrtle lake, on the east side line of T C 156, and at several other points. It is often brecciated as an autoclastic rock. This is well seen at the locality above mentioned, where the slate shows in a bluff dipping to the east. The top layer of the cliff is much brecciated and overhangs the lower normal slates which have been crumpled away. Similar breccia is also seen west of Frying-pan lake, on Bulsch lake and on the government road a mile east of Lost lake. These occurrences are all near the later diabase and the brecciation may be due to the diabase intrusion.

The prevailing dip of the Cobalt series is to the east at a low angle, generally not greater than 15°. Where the diabase has broken up as laccolites the sedimentary rocks have been tilted up more steeply. Along the contact of the diabase and the

rocks of the Cobalt series, extending across the long point in Gowganda lake, the spotted quartzite or slate seen on the north line of T C 27 dips to the west.

About half a mile north of Wilson lake in Nicol township the rocks of the Cobalt series dip gently to the west from the Keewatin. The succession is greywacké conglomerate, slate, quartzite and an upper coarse conglomerate which resembles the conglomerate along the west shore of Gowganda lake. This succession of strata is seen at other parts of the area. Sometimes the greywacké is underlain by a coarse boulder conglomerate, which is very similar in appearance to the upper conglomerate. The latest rocks are quartzite and arkose.

Unconformity at the Base of the Cobalt Series

At many localities in the area basal conglomerates and breccias occur in which the included fragments and boulders are syenite, granite, greenstone, porphyry, diabase, etc., which are found in the vicinity in place.

Fig. 79.—Basal conglomerate, Cobalt series, overlying granite, and containing boulders of granite. Northwest shore of Obushkong lake.

On the northwest shore of Obushkong lake, just north of the north line of L M 116, is a small patch of conglomerate with the underlying Laurentian showing through it. The conglomerate has rounded and angular pieces of the local Laurentian and also fragments of a rusty weathering diabase which cuts the Laurentian immediately at the conglomerate contact.

On the east line of W D 961, northeast of Gowganda lake, the basal conglomerate is composed almost entirely of fragments of grey porphyry which underlies the conglomerate.

North of Wilson lake are patches of conglomerate on the syenite. This syenite has a characteristic porphyritic texture, and fragments of this rock form the main part of the conglomerate. Other contacts could be cited of a like nature, so that, for this area at least, the base of the Cobalt series is formed from material which is very local and not transported any distance.

Unconformity in the Cobalt Series

Mr. N. L. Bowen found an unconformity on the north line of H R 311, west of Obushkong lake, where greywacké and fine-grained arkose show in a bluff about twelve feet in height. At the base of the arkose are about two feet of a coarse reddish conglomerate containing some small pieces of greywacké which, under the microscope, prove to be the same as the underlying greenish rock, thus indicating a break in the deposition. A similar break was seen southeast of Flanagan lake, near the south line of H S 712.

West of Gowganda lake, and on the long point extending into the lake, an upper conglomerate with a coarse matrix occurs in considerable thickness. Similar conglomerate is seen in other parts of the area. The writer is not certain that the few feet of conglomerate seen below the arkose series on Obushkong lake is equivalent to

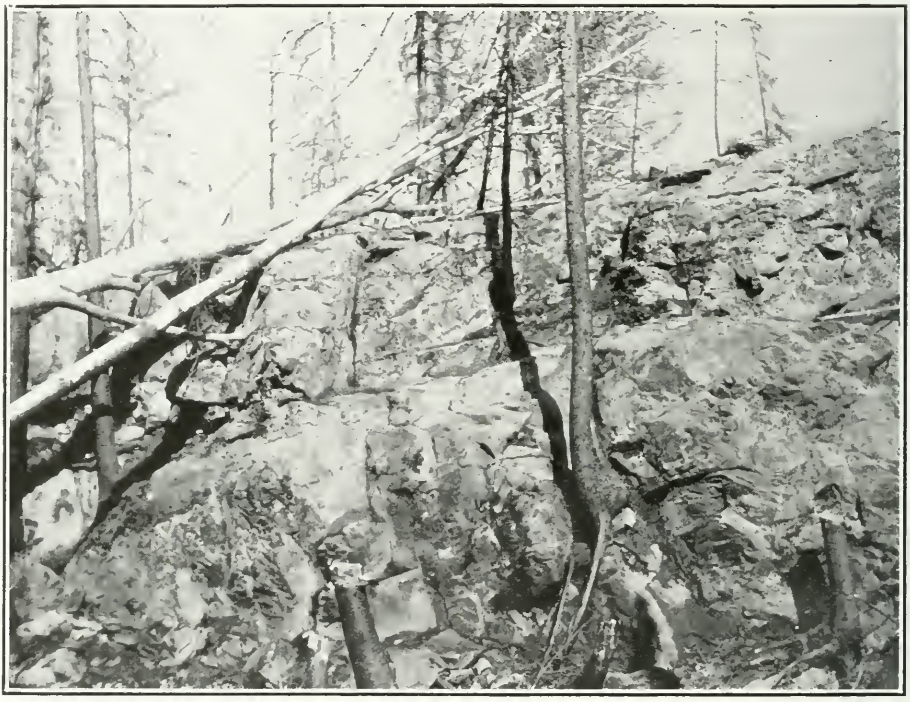

Fig. 80.—Unconformity between greywacké conglomerate and arkose (conglomerate). North line of H. R. 311, west shore of Obushkong lake.

all this conglomerate. Where there was any great thickness of conglomerate a search failed to show any inclusions when it rested on the underlying rocks. At some points there seemed to be an uneven surface and at others there did not seem to be any break. When the unconformities were seen they occurred very near the arkose series, with only a few feet of conglomerate material intervening.

In the map accompanying this report, rocks of the Huronian, now called the Cobalt series, have been distinguished by two colors, brown and yellow. The upper portion, shown in yellow, consists principally of quartzite and arkose, which will largely represent the Lorrain series of rocks exposed near Cobalt, while the lower portion, shown in brown, will represent the Cobalt series, consisting of greywacké, conglomerate, etc. The upper conglomerate may possibly belong to the upper or Lorrain series, but sufficient work was not done to separate it, consequently it is shown in the brown color.

Nipissing Diabase

The Keewatin, Laurentian and Huronian formations are all intruded by sills and dikes of diabase. The broad areas of diabase are sills which have spread out in or cut across the strata of the Cobalt series. At points the diabase has broken up into the overlying formations as laccolites.

In the Keewatin and Laurentian the intrusion is largely as narrow vertical dikes, a few chains in width.

The sill character of the diabase is well shown in that occurrence which extends north from the east side of Elkhorn lake to Logan lake. At points the diabase both underlies and overlies the slate and the sill dips to the east. The thickness of the sill in this area is about 400 feet. Just southeast of Crawford lake the diabase under-

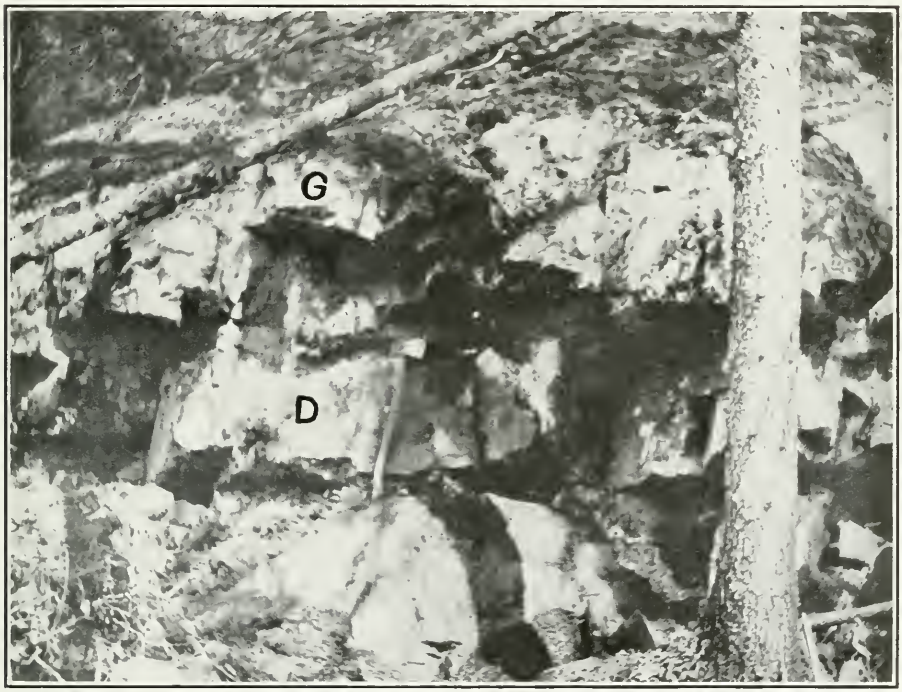

Fig. 81.—Greywacké (G) of the Cobalt series underlain almost horizontally by the Nipissing diabase (D). South of Logan lake.

lies the greywacké, with dip to the north. To the west of the Boyd-Gordon, the contact is in a valley, but the topography would suggest that the contact is rather steep and to the west. These contacts would indicate that the sedimentary rocks from this point west to the Elkhorn sill are underlain by diabase. At many points near the cooling surface the sill diabase has a marked columnar structure, which is developed at right angles to the dip of the sill.

The broad sill areas would all appear to be closely connected with one intrusion and at points to have broken up into the overlying formation, and, on erosion, have been exposed as more or less isolated areas. These areas have generally a north and south extension, and this is also noticeable in the narrow dikes.

The dike diabase has a very uniform character and grain, whereas the sill diabase shows much differentiation, ranging from basic phases through intermediate stages to reddish granitic rocks. In the same mass the texture may vary from a fine ophitic to a coarse granular or allotriomorphic character.

The normal diabase is generally of a dark greenish grey color. A sample from the north line of H F 204 shows labradorite feldspar set in augite, which is partially altered to green hornblende. Quartz in micrographic intergrowth with feldspar fills the interstices.

A sample from the west side line of H S 542, east of Crawford lake, is fine-grained and consists of plagioclase, largely altered to saussurite. The ferromagnesian minerals are green and brown hornblende, with a little chlorite. Quartz and feldspar in micrographic intergrowth are also present.

A section of a coarse phase of the diabase, which may be called a gabbro, from a shaft on W J 8 near Leroy lake, is essentially plagioclase altered to saussurite, augite partly altered to uralite and abundant intergrowth of quartz and plagioclase.

The red phase of the diabase, which has a very prominent development in parts of the sill areas, is abundant in the vicinity of Lost lake and to a lesser extent in other localities. It varies greatly in texture and color very locally, and is largely made up of a granophyric mixture of quartz and feldspar. In some coarse samples this structure can be seen in hand specimens. This red rock may be traced gradually into normal diabase, with many variations in the intermediate stage.

A section of a coarse, reddish brown granophyre from the south line of H R 405, east of Lost lake, is largely the granophyric intergrowth developed around stout prisms of acid plagioclase. The intergrowth, very fine at the centre, increases in size as it radiates outward, with much free quartz on the margin. Chlorite occurs in very minor quantity. A dark grey and fairly coarse sample from the wall of an aplite dike on the Latail claim, just northeast of Flanagan lake, is more acid than the normal diabase type. The section shows it to be largely an intergrowth of quartz and feldspar, with some laths of plagioclase, secondary hornblende and calcite in minor quantity. The magnetite present is altering to leucoxene.

Later Dikes

The sill diabase has been intruded by later basic dikes in part of the area. West of Calcite creek, on the north line of H B 28, is a dike of olivine diabase about one chain wide which cuts the sill diabase quite distinctly. At its contact it is a very fine-grained basaltic rock, which becomes coarser rapidly and shows quite large phenocrysts of light greenish plagioclase in a diabasic groundmass of plagioclase, augite and olivine. This dike is very similar to that described by Mr. Bowen west of Obushkong lake and to other porphyritic dikes in the area, so that many of these narrow porphyritic dikes are evidently younger than the sill diabase.

A dike of later diabase cutting the diabase sill of the Cobalt area is described by W. G. Miller.* This dike is porphyritic and olivine-bearing, and would thus be similar to the later olivine diabase dikes of the Gowganda area.

A non-porphyritic quartz-diabase dike one chain wide cuts the sill diabase on T C 156, just south of Myrtle lake.

Mr. N. L. Bowen gives the following descriptions of some diabases from the Gowganda area:—

Small Dike Cutting Davidson Lake Sill

"The dike is fine-grained, showing slender laths of plagioclase averaging 0.3 mm. in length, ranging from acid labradorite to acid bytownite, and set in a groundmass of augite. Augite fills the interstices and is sometimes altered to a felt of needles of low birefringence with skeletons of iron ore. Black iron ore forms about 15 per cent. of the rock. No quartz could be found.

*Bureau of Mines Report, 1907, Part II., p. 64. *See* preceding page, chap. I.

Olivine Diabase Dike, West of Obushkong Lake, Cutting Huronian and Showing Large Phenocrysts of Feldspar

"The feldspar phenocrysts carefully determined are mainly andesine. . . . A narrow outer rim usually shows zonal intergrowth, with labradorite and andesine alternating. The groundmass consists of plagioclase, augite, olivine, apatite and iron ores. The plagioclase is mainly labradorite, showing zonal growth, with acid andesine forming the outer zones. The olivine is in small grains and most of it appears to have crystallized before the feldspar. A brownish augite fills the interstices between the feldspar laths in perfect ophitic structure. Apatite is usually abundant in long needles. No quartz or micropegmatite was found.

"In the examination of some sections of normal sill diabase, in addition to the normal augite, another pyroxene occurs in lesser amount, showing nearly always parallel extinction but in some sections as high as 10°. The maximum interference color is a pale yellow of the first order. The optical character is positive as in the

Fig. 82.—Contact of slate of Cobalt series (H), and Nipissing diabase (D), Bulsch lake. The slate underlies the diabase.

augite, and a faint pleochroism is shown. The pyroxene is probably enstatite. The occurrence of slightly oblique extinction in rare cases is to be explained in its wide axial angles."

Veins

With a few exceptions most of the promising silver-bearing veins have been located in the Nipissing diabase, unlike the Cobalt area where the great majority of the productive veins are in the conglomerate of the Cobalt series. The most conspicuous exception is the vein in the conglomerate on the Millerett property, which so far has proved one of the most important in the Gowganda camp. Native silver occurs in small quantity in the Keewatin near Miller lake, and strong veins of smaltite and niccolite have been found in the Keewatin and conglomerate. Generally the diabase has been more thoroughly prospected than the Keewatin or Cobalt series, which should be worthy of close attention near contacts with the diabase.

In the diabase itself the silver-bearing veins appear to be confined to the broad sills and much differentiated areas, rather than to the narrow dikes. The latter have not been fissured to any extent.

Many of the narrow veins seem to be closely associated with the solidification of the diabase, with the resultant cooling cracks being filled with vein solutions. The presence of aplite in many of the veins would indicate this. Sometimes one or both walls of the aplite pass gradually into the normal diabase. The veins which are the resultant of cooling repeatedly change their direction and fade away to mere cracks. Other veins appear to be the result of more extensive fissuring and may be followed on several adjacent claims in a fairly straight course. Native silver has been discovered on a great number of claims, but only a few of these have been shown to be of much commercial value.

In the diabase itself there are certain enriched areas. In the occurrence of diabase just west of Gowganda lake there are two such areas, the southerly one including the Reeve-Dobie, Welch, Bartlett, Burke-Remy and Crawford, and the northerly the Boyd Gordon, Mann, Silvers Limited, and Milne. To the north of this again, near Myrtle lake, there are a number of promising veins on the Dufferin mines and Bishop

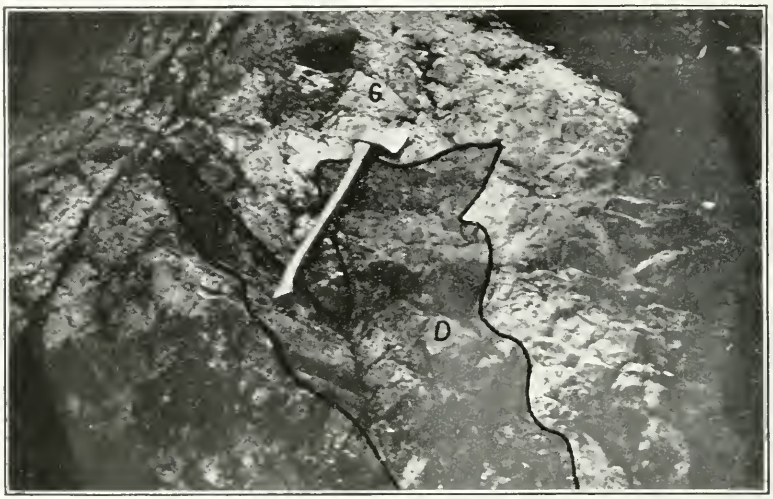

Fig. 83.—Granite (G) intruded by Nipissing diabase (D), south of Bloom lake.

properties which show native silver, but at the time of the writer's visit no shipping ore had been uncovered.

East of Gowganda lake is a small area including the Millerett, Bonsall and Miller Lake-O'Brien, and, southeast of Miller lake, the Morrison, McKay, Chapelle and Leroy properties.

Another small area lies to the northeast of Flanagan lake in Leith, including the Sweet and Lataif claims.

There is a marked similarity in the occurrence of silver ore on many of the properties. The veins are usually quite narrow, widening in places to several inches and again pinching out to a crack rather abruptly. The ore occurs in short shoots or bunches in the vein, with portions of the vein quite barren. This has caused some difficulty at several properties in procuring any quantity of shipping ore. The diabase occasionally is very much intersected with mere cracks which are filled with sheets of native silver. This is particularly noticeable at the Reeve-Dobie—along the main fissuring—where much of the diabase would be good milling ore. In the Flanagan lake area some aplite dikes have been split open after solidification and solutions of calcite, smaltite, etc., deposited later. The vein filling is usually calcite with silver, smaltite, niccolite and occasionally native bismuth and bismuthinite. Copper pyrites is also seen in some of the silver-bearing veins, but more commonly occurs in veins which

have not proved of economic importance. Occasionally quartz occurs with calcite in the gangue, generally along the walls of the fissure. In some of the smaller veins the fissures have been entirely filled over short distances with smaltite, niccolite and silver. Some of the veins have been oxidized for a few feet in depth, but generally the undecomposed ore may be seen quite near the surface. An open leached-out crack occasionally is all the prospector at first finds which, on being followed down, frequently reveals a calcite vein.

In parts of the area there are some very strong calcite veins, some as wide as three feet, and which have been traced over several claims. These are usually quite

Fig. 84.—Trench, showing fissuring in diabase, on mining claim H. R. 250, west of Gowganda lake.

barren but show that there has been extensive fissuring in the diabase. An exception to this is the large vein on the Morrison, T C 315. This vein is reported to have been traced 2,000 feet and the writer saw it at several points uncovered with a width of from two to three feet of calcite. Near the camp this vein strikes N. 68° E. mag. It consists of a series of wide lenses, and had been opened up by a pit near the camp where, for a distance of eight feet, some rich ore consisting of silver, smaltite, niccolite and bismuth in calcite had been taken out. The ore occurs in a rich bunch at this point. At other points along the vein where stripped the writer did not observe a similar mineralization.

There is a wide calcite vein, with a strike similar to the above vein, on the Miller Lake-O'Brien property which cuts a north and south silver-bearing vein, proving it to be of later age. Many of the wide veins may therefore belong to a later system than those narrow veins which so frequently carry silver values.

In reference to the deposits in the diabase, it may be stated that several veins which carried good values in native silver at the surface have not proven to hold these values at depth and, in many cases, the silver content has entirely disappeared within forty feet, while the veins continue as strong as on the surface. Again, the veins themselves have disappeared at the same depth or narrowed to mere cracks. As the surface showings are usually rich over short distances with barren intervals or tightening of seams, this condition may occur in the vertical direction. There does not seem any reason why the values should not carry to a considerable depth, as some of the rich surface showings may be traced at intervals over several hundred feet.

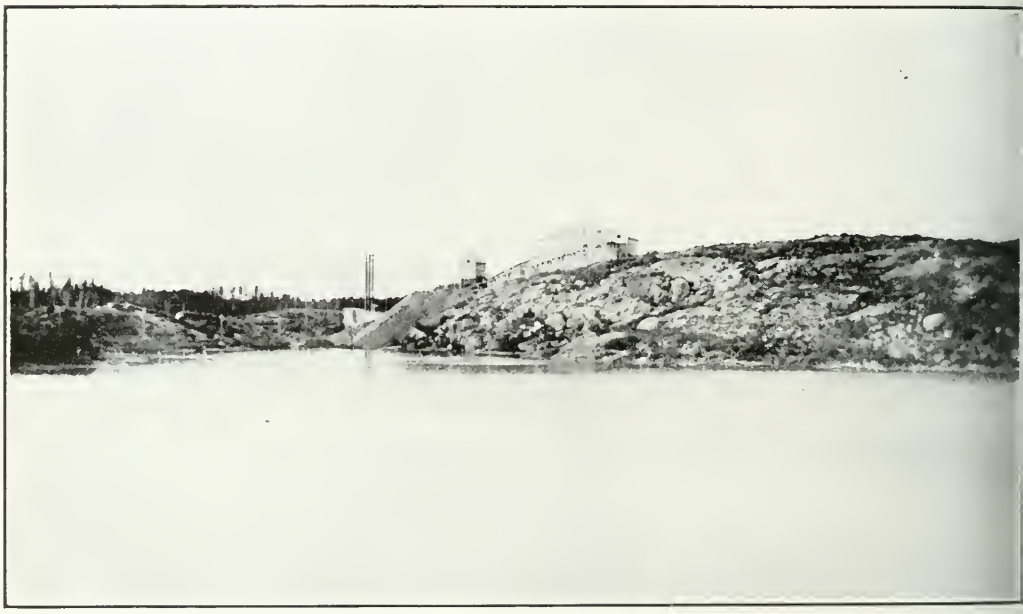

Fig. 85.—Millerett mine, showing stamp mill.

The Millerett Mine*

This property, R S C 95, formerly known as the Blackburn, is situated three-quarters of a mile northeast of Miller lake. Conglomerate, quartz-diabase and Keewatin greenstone occur on the property. Of these, only the conglomerate and diabase have shown silver-bearing veins. Twelve veins were found, five of which contained shoots of native silver, while the calcite and smaltite filling of two others showed silver on assay.

The principal vein is on the northeastern portion of the claim entirely in the conglomerate area. The strike is northwest and southeast and dip 70° to the southeast. This vein was traced on the slope of the hill for 300 feet. The conglomerate overlies the diabase sill.

An adit level was run into the hillside for a length of 253 feet, giving a back of 50 feet at the end. Near the entrance of the adit a vertical shaft was sunk 85 feet, and at the 70-foot level a drift was run to the southeast. The main ore shoot has a length of 150 feet, the vein averaging slightly over two inches in width and consisting

*For a further description of the Millerett mine and other properties at Gowganda, reference can be made to an article, "Gowganda during 1911," by G. M. Colvocoresses, Canadian Mining Journal, Vol. 33, No. 8, p. 256.

fine leaflets, impregnated the conglomerate for a width of two feet on each side of the vein. At other parts of the vein the filling is calcite, with smaltite in places. The great proportion of the ore obtained from the conglomerate was taken from above the 70-foot level, where the shoot was stoped to the surface. A smaller ore shoot in a winze below the 70-foot level was also stoped.

Next to the conglomerate vein No. 7 in the diabase was the most important, producing about 200,000 ounces of silver. The ore in the vein has been stoped from below the 150-foot level to the surface, the shoot narrowing towards the surface, while the pitch of the shoot is to the east. The diabase along the vein carried silver values along the fractures, giving an average of 18 inches of milling ore. Small amounts of silver were taken from other veins in the diabase, but these were only in stringers or short shoots. The veins in the diabase, with one exception, strike nearly E. and W., of calcite, smaltite and cobalt oxides, with native silver. Native silver, in specks and with the dip vertical or about 85° to the south. The diabase sill rises from the east

Fig. 86.—Camp, Millerett mine.

at about 30°. It shows a marked columnar structure which, in places, takes on a concentric or cylindrical character, the rock frequently breaking in curved platy blocks.

The contact between the conglomerate and Keewatin as shown in the adit level is very steep to the west. The conglomerate was evidently laid down in an old gulch in the Keewatin surface.

About 14,000 tons of ore have been treated in the mill, which has a capacity of from 35 to 40 tons daily, depending on whether diabase or conglomerate is being crushed.

About 700,000 ounces of silver have been taken from the workings.

Miller Lake O'Brien

This property adjoins the Millerett to the south. The main workings are along the centre line of mining claims R S C 90 and 91.

The rock containing the silver-bearing veins is quartz diabase, which rises as a sill from the east at about 30°. Two hundred feet east of the main workings is an outcropping of Keewatin greenstone which overlies the sill.

The property has been developed from two shafts, No. 1 down 100 feet and No. 2 to the 200-foot level. When visited in October, 1912, the deepest workings were on the 300-foot level, where a 50-foot winze had been sunk to the south of No. 2 shaft from the 250-foot level. The property has been developed on six levels, while the ore which occurs in shoots has been stoped out above the 140-foot level. There is another stope on the 250-foot level.

Development has shown that there are two main vein systems, called No. 1 and No. 2. These have a general strike of N. and S. and are inclined slightly to the west. The No. 2 system has produced nearly all the ore and consequently the development

Fig. 87.—Miller Lake—O'Brien mine.

work has been mostly done there. It contains two series of veins, called hanging wall and foot wall veins respectively.

In each of these systems there are two or more veins which, where the ore shoots occur, have been sufficiently close to mine in one stope. In the ore shoots individual veins are not always productive, but, when one is barren, a parallel one may carry high-grade ore. Both the hanging and foot wall veins have shown ore shoots. Above the 140-foot level ore has been stoped from both the hanging and foot wall veins, while below this level, to the south of the main shaft, the ore has been produced from the foot wall system of veins. Very little ore was found above the 60-foot level. In the workings on the 250-foot level, 125 feet south of the main shaft, a silver-bearing vein was discovered which has an E. and W. strike. This vein had been drifted on for 170 feet, and ore was being stoped above this level.

The great proportion of the silver values are contained within the veins with only a small impregnation of the diabase wall rock. The ore is massive smaltite and silver.

Development has shown the existence of a fault which crosses No. 1 shaft at the

50-foot level and No. 2 shaft at the 140-foot level. This fault dips to the N. and E. A wide calcite vein, which strikes N. 60° E., and is exposed on the surface, has been displaced eight feet by the fault.

Shipments have been made from the property for the past two years.

Mann Mines

The Mann mines are situated on the northwest arm of Gowganda lake. The early discoveries were made in the summer of 1908, causing a rush to the west side of Gowganda lake.

Four shafts have been sunk to moderate depths. Of these, No. 3 on an east and west vein, has been sunk 80 feet, with one drift 165 feet east and another 203 feet west. Two cross-cuts have also been made from the west drift. The early drifting at

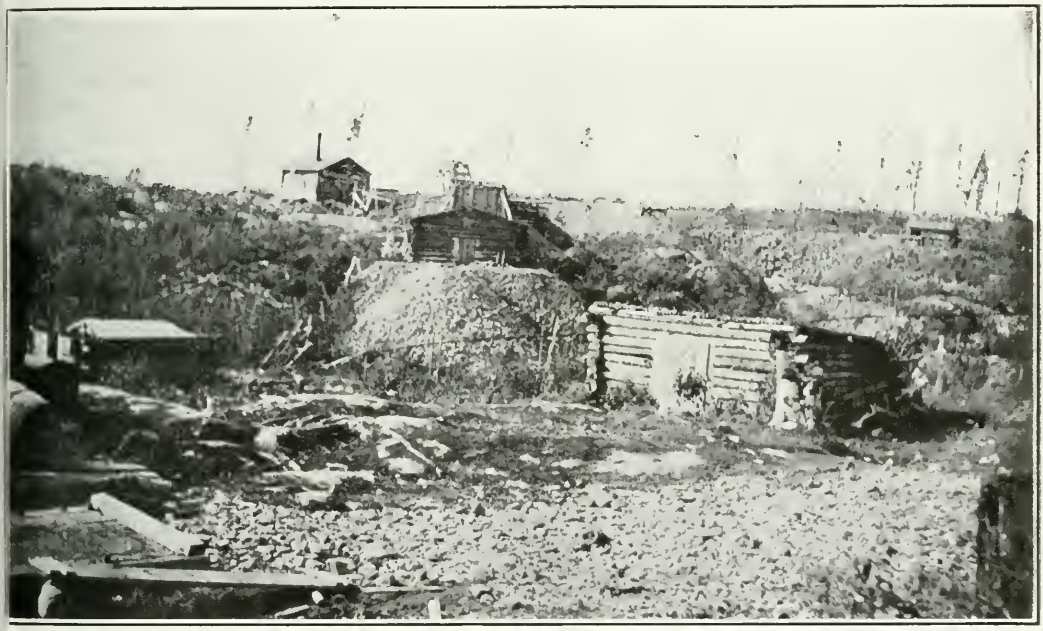

Fig. 88.—No. 3 shaft, Mann mine.

the 80-foot level did not disclose any ore, but further development in the west drift has shown a shoot of high-grade ore immediately south of the old working, which was discovered by following a stringer which showed in the old working. A part of this shoot has been stoped up 15 feet, while two underhand stopes 15 and 20 feet in depth have also been made. This shoot is reported to have been followed for 200 feet. No. 5 shaft has been started on the ridge to the east of that on which is No. 3 shaft. This shaft will be a permanent one, and is fitted with a cage. It was down 56 feet, and will be connected with No. 3 on the 80-foot level and also on the 200-foot level with the winze which is now being sunk in the west drift at No. 3 shaft. Several open cuts have been made. From one of these, west of No. 5 shaft, which is 30 feet long and 30 feet deep, 14 tons of high-grade ore were taken out and shipped. No. 2 shaft has been sunk 60 feet on the continuation of the Boyd-Gordon discovery vein.

The greater number of the veins have a general E. and W. strike, and many of these have been trenched over considerable distances but have not been prospected at depth. A north and south valley, which is sharply defined, may indicate a fault in the diabase, as the veins so far trenched on the two ridges do not correspond in position.

Twenty-five tons of high-grade ore have been taken from the workings. The ore is chiefly massive smaltite and silver.

Two thousand tons of milling rock had accumulated on the dump. Of this an average lot of 20 tons was treated at the Millerett mill, where assays showed a value of 58.8 ounces of silver to the ton.

In one shipment from this property the high-grade ore which averaged about 2,000 ounces silver to the ton also contained $2.00 per ton in gold.

Bartlett Mines

The Bartlett mines, which were closed down for a time, were reopened in 1912. In 1909 two shafts were sunk on the property. No. 1 shaft, which is just south of the power plant, was started on a lens of high-grade silver ore, which occurred in a vein striking nearly E. and W. The lens was followed for 25 feet while the shaft was continued to the 100-foot level. Short drifts were run at the 30-foot level, and at the 100-foot level 290 feet of cross-cutting was done. To the southwest of the shaft there are several open cuts and pits on a vein with strike N. 52° E., which is traceable 350 feet. Some silver ore was taken from an open cut near the shaft. There is an aplite dike which in places has been greatly fractured, with the formation of calcite lenses along parts of it. The calcite contains silver and copper pyrites in parts, while silver in leaf form occurs in the fractured aplite and the diabase wall rock. Some of the diabase is quite decomposed along the vein, and thin leaves and scales of native silver occur 18 inches from the vein.

At No. 2 shaft there are 230 feet of cross-cutting at the 100-foot level. Directly west of the shaft there is an aplite dike, and over a short distance a lens of calcite. A shallow open cut was made at this point, and a few bags of material carrying high values in native silver were extracted from a short shoot. It is expected that the property will be further developed at the 100-foot levels of the two shafts.

South Bay

Active development was in progress on that part of the property which adjoins the southeast claim of the Bartlett mine when visited in October, 1912.

A great amount of surface trenching had been accomplished, and open cuts had been made on some of the veins. Smaltite, niccolite and silver were found at different points. At one place 90 feet south of the shaft some high-grade ore had been taken from a cut about twenty feet in length. The shaft was down 100 feet, and a cross-cut was being run to the south to intersect three E. and W. veins which showed on the surface. A north cross-cut was also being run towards a vein with strike N. 60° W. which crosses from the Bartlett property. A 50-foot shaft had also been sunk just south of the north boundary line, on a vein parallel to the one just mentioned. The material on the dump consists of diabase, with aplite and calcite. Native silver and argentite occur in some of the vein material. Some crystallized epidote showing some silver has been found in this vein.

Columnar structure is quite pronounced in the diabase, and along the joints veins have been formed, suggesting the filling of cooling cracks. Some of the country rock is quite reddish and coarse-grained, and traceable into the dark grey diabase. Much of the reddish rock adjoining the veins is greatly stained with cobalt and nickel bloom.

Discoveries of smaltite, niccolite and silver have been reported in the north part of the township of Donovan and the south part of Charters township, about eleven miles south of Gowganda. These discoveries are in the Nipissing diabase.

The Flanagan lake area, in which the Hudson Bay Mining Company are operating, and the Calcite lake area, where the Powerful mine is being developed, were not visited in 1912.

THE SHINING TREE SILVER AREA

By R. B. Stewart

In accordance with instructions received from the Provincial Geologist, the writer spent part of the season of 1912 examining the area east of Shining Tree lake. Mr. Dowler Freeman served as field assistant during the season.

Discoveries of native silver made in 1909 attracted attention to the area and much development work followed.

Considerable information regarding the geology of the district around Shining Tree lake has already been published. In 1896 Mr. E. M. Burwash* reported on the geology along the Nipissing-Sudbury boundary line, and six years later Dr. Coleman† made an investigation of the iron formation in the vicinity of Shining Tree lake. In 1910 Mr. W. H. Collins‡ made a survey of the area for the Geological Survey Branch of the Department of Mines at Ottawa.

Location and Transportation

The area is situated chiefly in the township of Leonard, in the District of Temiskaming.

The area can be reached from Gowganda, or Ruel on the Canadian Northern railway. A trail from the west side of Gowganda lake runs in a southwesterly direction to Shining Tree lake—a distance of about 15 miles. A rather circuitous canoe route from Gowganda by way of Spawning lake and the Montreal river is also a means of ingress to the area. Probably the best route is from Ruel by way of West Shining Tree lake. The Opickinimika river and lake afford a water course from Ruel to Allin lake, which is about a mile south of West Shining Tree lake. Gasoline launches were in operation on this part of the route during the season. From West Shining Tree lake a canoe route crossing the townships of Asquith and Fawcett, by way of Granite lake and the Montreal river, reaches Shining Tree lake.

The transportation of supplies into the area is a difficult matter, as many portages occur on the canoe routes, and the lack of good transportation facilities has retarded development work. A wagon road from mileage 80 on the C. N. Ry. to West Shining Tree and Shining Tree lakes is under construction.

Topography

The area presents the usual topographical features of northern Ontario. The highest elevation observed is about 175 feet (aneroid) above the general level. The lakes are not as numerous as in many parts of northern Ontario. Shining Tree lake is the largest and is about four miles long and over a mile across in the widest part.

Geology

The Keewatin formation extends over part of the area. It is represented chiefly by greenstones showing marked ellipsoidal structure and by altered diabases or basalts. A narrow belt of the iron formation occurs east of Fournier lake, which lies about the centre of the township of Leonard. The trend of the outcrop is a little west of north. Another outcrop, showing bright red jasper, occurs in the southwest part of Tyrrell township. The latter exposure is probably a continuation of the one at Fournier lake, but later sedimentary rocks separate the two areas.

*Sixth Report of Bureau of Mines, 1896, p. 173.
†Report of Bureau of Mines, 1901, p. 181.
‡Summary Report, Geological Survey, 1910, p. 196.

The Cobalt series is represented by conglomerate, quartzite and banded slate. These rocks cover much of the territory examined. The conglomerate contains well rounded boulders of granite, greenstones and other rocks of the older formation. The quartzite or arkose is similar to that of the Elk lake area. The banded slate lies practically horizontal, but in several places it was observed that it dips slightly toward the overlying diabase.

A sill of Nipissing diabase covers a portion of the area, and overlies the Keewatin and the Cobalt series. The diabase is rather coarse in the grain and varies from a dark colored rock of gabbroid texture to light colored acid types. These acid phases occur as aplite dikes, and in small areas where the chief rock-forming mineral is a reddish feldspar.

Fig. 89.—Specimen 6½ inches in width of Agglomerate, showing amygdaloidal structure, east side of Spider lake, Leonard township.

Dikes of olivine diabase were observed intruding all the formations in the area except the Nipissing diabase. Phenocrysts of feldspar, an inch or more across, can be found occasionally in the olivine diabase.

Besides the rocks described above other types occur whose place in the geological succession was not definitely determined. Agglomerates are exposed on the east side of Shining Tree lake at its northern end, and on the east side of Spider lake. In the latter place the agglomerate consists chiefly of angular fragments of a bluish grey rock cemented with a rather fine-grained darker material. Many of the fragments have a finely vesicular structure but occasionally some contain larger amygdules—half an inch in length or more—which are filled with quartz.

The agglomerate exposed on the east side of Shining Tree lake presents a different appearance than the one described. This rock is made up of fragments, an inch or more across, of a pink colored, finely vesicular rock set in a fine-grained, green colored matrix. The vesicular cavities are filled chiefly with calcite, but some contain quartz.

A sedimentary series, consisting of a fine-grained slate rock, interbanded with a slightly coarser grained and more silicious rock is exposed in several places on the shore of Black lake, and on the islands in the lake where it can be observed very distinctly. Here the strike of these interbanded rocks is a little west of north and their dip is almost 90° to the west. The remnants of several folds of interbanded rocks, strikingly similar to those on the islands in Black lake, occur on the east side of Herron lake and appear to be overlain by the flat lying banded slate of the Cobalt series. It appears from their relation to the Cobalt series and from their disturbed condition that these folded and steeply dipping fragmental rocks belong to the Temiskaming series.

In the vicinity of Black and Spider lakes a grey-colored, cherty-looking porphyritic rock is exposed in several places. The phenocrysts are usually feldspar and quartz. Later disturbances have crushed and brecciated the porphyry in places to such an extent that it resembles a fragmental rock.

The Pleistocene deposits effectually conceal the underlying rocks in several parts

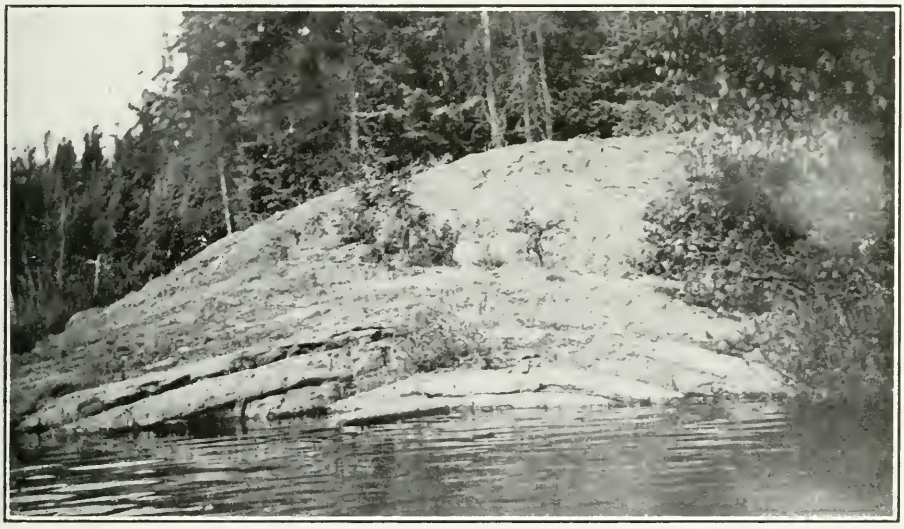

Fig. 90.—Folded sedimentary rocks, east side of Herron lake, Leonard township.

of the area, but in other places a thin sheet of boulder till forms the superficial material. Esker-like ridges of sand and gravel occur in several places, and sand deposits cover stretches of considerable size. Slight stratification was observed in the sand about half a mile southwest of Fournier lake.

Character of the Veins

The silver-bearing veins occur in the Nipissing diabase, although similar veins have been located in the agglomerate and conglomerate. The veins occupy distinct vertical fissures that have a general strike of north thirty to forty degrees east (magnetic). Some east and west fractures occur in the diabase, but these are generally mere cracks.

Numerous veins occur on many of the properties, but the majority of them will average only a few inches in width. Large veins, four to eight feet wide in places and extending across two or three adjoining claims, are a rather marked feature of the area.

Calcite and quartz constitute the chief vein filling materials. The quartz is found frequently in a thin layer on the walls, and the calcite, usually of a white and coarsely

crystalline variety, especially in the larger veins, fills the remainder of the fissure. The weathering of the calcite has formed cavities many feet in depth in several of the veins, and in some places practically all the calcite has been dissolved out to a depth of several feet for some distance along the vein. Copper pyrites, smaltite, niccolite, native bismuth, galena, and cobalt bloom are the associated minerals in the veins.

Native silver was seen on five claims. The quantity in every case was small, and the silver-bearing veins are narrow. The silver occurs in the calcite and quartz. It is also found in the black muck-like material that collects in the weathered-out cavities in the calcite. No silver, as far as the writer could ascertain, has been found in the large veins, although no evidence was obtained to show that the large ones were not contemporaneous with the smaller veins.

Mining Locations

The Seville Exploration Syndicate

The holdings of this company comprise a group of eleven claims, which are situated south and west of Fournier lake. Silver was first found in the area on this property in May, 1909. Considerable surface work has been done on the claims. Many well-

Fig. 91.—Folded sedimentary rocks, east side of Herron lake, Leonard township.

defined veins occur in several places on the property. Much bloom, with smaltite, copper pyrites, and a small amount of bismuth was observed in several of the veins. No silver was found in place, but small specks were found in pieces of vein matter that had been taken out of one of the veins. The trenches are filling up again to a certain extent, so that small isolated showings of silver could easily escape detection. All the veins that were visited are in the diabase. No work was in progress on this property during the season.

Turnbull's Claims

These claims are situated immediately west of those of the Seville Exploration Syndicate. The country rock is diabase. On one of the claims a large calcite vein has been uncovered for about three chains. This vein is 3 or 4 feet wide in places. Just west of the large vein another one occurs that will average probably 8 or 10 inches in width for a distance of about three claims. The two veins have a strike of about north 30 degrees east magnetic. In the vicinity of the large veins many small stringers occur, one of which carries cobalt bloom.

E. L. Greave's Claims

This group of three claims is located just south of Turnbull's. Surface work was being carried on when the writer visited the property. Three veins 3 to 6 inches wide occur in the diabase on the most southerly claim. Small amounts of silver were seen in the three veins. The gangue material is quartz and calcite, with small quantities of copper pyrites, galena and smaltite. Surface work on the most northerly claim has exposed two veins of quartz and calcite associated with aplitic material, but no silver had been discovered.

Caswell-Eplett Claims

These claims (W D 1145 and 1146) are located a little west of Fournier lake and immediately north of the claims of the Seville Exploration Syndicate. The formation is chiefly diabase, but the contact between the diabase and the Cobalt series occurs on W D 1145. Quite extensive surface work has exposed many veins on W D 1146. Cobalt bloom occurs in several of the veins. Small flakes of native silver were found in the black muck-like material in a small vein just west of the shaft.

The most extensive underground work in the area has been done on W D 1146. Mining operations were not in progress when the writer was on the property, but some information regarding the underground work was obtained from Mr. Grant Caswell. A vertical shaft was sunk 100 feet on a vein that showed silver at the surface. A cross-cut was run 100 feet east and the same distance west from the shaft. On the east side a calcite vein eighteen inches wide, and a vein of niccolite 4 to 6 inches wide were crossed. A calcite vein was found on the west side of the shaft.

The plant consists of a 20-h.p. upright boiler, a 5 x 5 hoist, three pumps and a Rand drill.

It was intended to resume work during the winter.

Archibald's Claim

This claim lies immediately east of the group of claims of the Seville Exploration Syndicate. Part of the property is heavily overburdened with sand that shows slight stratification. The rock formation is diabase. Surface work has exposed three veins from 3 to 6 inches wide and having a general north-south strike. Many smaller stringers and fissures occur in the vicinity of these veins. A small quantity of native silver was observed in one of the larger veins. Quartz and calcite are the chief vein filling materials. Small amounts of galena, copper pyrites and cobalt bloom are present.

Neeland's Claim

This claim (H S 448) lies just north of W D 1146. Considerable surface work has exposed six or seven veins a few inches in width and with a strike of north to north 60° east. The formation is diabase. Quartz and calcite are the chief vein filling materials, but copper pyrites and cobalt bloom are present, and in one vein niccolite one to two inches wide occurs. No silver was seen on this property, but the writer was informed that good samples of native silver had been taken from one of the veins.

Nellie Lake Syndicate

This company have a group of 19 surveyed claims located in the vicinity of Nellie lake. The chief underlying rock is diabase, but some claims in the group are located on Keewatin. Extensive surface work has been done on several of the claims and many veins have been exposed, of which some are very large. During the season a shaft 34 feet deep was sunk on a large vein that occurs on T C 730 and T C 731. This vein has been uncovered for a distance of about 8 chains, and is 5 to 6 feet wide in places. Its average width is probably about two feet. The gangue material is calcite, but cobalt bloom, smaltite, niccolite, and bismuth in small quantities are present. The

vein has almost vertical dip and strikes, in a general way, about north 25° east. No silver was seen in this vein.

Several other shafts and test pits, varying from 20 to 60 feet in depth, have been sunk on promising looking veins on these claims.

The development work during the summer was under the management of Mr. Mullan.

The McIntosh Mines Ltd.

This company's claims are located west of Spider lake, in Leonard township.

The prevailing formation is diabase, but areas of the underlying conglomerate and banded slate occur on several of the claims.

Just east of Spider lake a vein 6 to 8 inches wide has been uncovered for several chains. The gangue is quartz and calcite, with considerable copper pyrites and cobalt bloom. This vein dips at a high angle to the west. The surrounding rock has been

Fig. 92.—Camps of the McIntosh Mines, Limited, at Spider lake, Leonard township.

severely shattered and many smaller veins occur in the immediate vicinity. A shaft 65 feet deep has been put down on this vein.

Just east of the vein described above, another vein has been located. This is a very long vein, that runs in a southwesterly direction on to B G 264, crosses the northwest corner of Dalton Thomas' claim and appears in B G 252 for several chains. This vein varies in width from a mere crack to 5 feet in width. It dips in places at a high angle to the west. Calcite and quartz are the chief vein filling materials, but copper pyrites and cobalt bloom are abundant. Where the vein crosses Dalton Thomas' claim niccolite one inch wide occurs.

Camps have been erected on the property and a 12-h.p. boiler and hoist have been installed at the shaft. No work was in progress during the season.

The Darby Claims

These claims are located at Horse Shoe lake. The formation is diabase. Surface work has uncovered several veins that have the general characteristics of the veins of the area.

L. O. Hedlund's Claims

This group of three claims is located in the southeastern portion of Leonard. The formation is diabase overlying the Cobalt series. A vein striking about northeast has been uncovered for several chains. A test pit has been put down on this vein, which is about a foot wide at the pit. Calcite and quartz are the chief vein materials. Cobalt bloom, small quantities of smaltite and copper pyrites are present.

The Exploration Syndicate of Ontario

This company control a very large number of claims in the area. At Shining Tree lake a number of claims have been located on the west side. South of the lake a group of twenty-eight claims have been staked on several areas of diabase that occur

Fig. 93.—Camps of the Exploration Syndicate of Ontario at Treacy lake, North Williams township.

in that locality. No veins were seen on this group, but the writer was informed by Mr. Smith, formerly engineer for the company, that a strong vein of smaltite occurs on one of these claims.

This company own a group of sixteen claims at Treacy lake, in the southwest portion of the township of North Williams. Considerable work has been done here. On T C 338 a shaft 7½ by 9 feet and 50 feet deep has been put down. A cross-cut runs 48 feet to the southwest. The surface work near the shaft has exposed several narrow veins in the diabase. Native silver was seen in two of these veins.

Comfortable camps have been built on this property and a 12-h.p. boiler and hoist have been installed. During the season a small gang was engaged in surface work.

FLORENCE LAKE, SHINING TREE AND ROSIE CREEK AREAS

By W. H. Collins

"Florence lake, at the head waters of Lady Evelyn river, lying 38 miles west of Latchford, is most easily reached from Temagami or Latchford station on the Temiskaming and Northern Ontario railway. . . . Florence lake is an irregular body of beautifully clear water, six miles in length, lying 1,190 feet above sea level. . . . The geology of the district is simple; a quartzite of Huronian age traversed by sills and dikes of diabase covers most of the area. The quartzite is a greyish or greenish-white rock, usually feldspathic, which frequently grades into arkose or becomes finely conglomeratic. The bedding planes are indistinct, so that the rock has a massive appearance, and the dip and strike are seldom determinable. A few reliable observations of the dip indicate a gently undulating attitude with a general southeasterly inclination. The diabase is quite similar to that found in the Montreal River district. The diabase exhibits the usual fine-grained and gabbroid types and occasionally an acid syenite phase. It is cut by aplite dikes and quartz calcite veins. The quartz calcite veins show the same structure as those of the Montreal River district, but were observed to carry only chalcopyrite, except at one point near the middle of Florence lake, where a trace of cobalt bloom was perceived."*

"Calcite veins of the same type as the silver-cobalt veins of Gowganda and Cobalt districts are associated with remnants of quartz-diabase sills that occur at intervals throughout the district. But with few exceptions they are too poorly mineralized to be economically important, and are interesting only in showing how persistently silver-cobalt deposits accompany the diabase. Most of the discoveries were made in 1909, since which time prospecting for silver in this district has steadily declined, and has now almost ceased except near Shining Tree lake.

Shining Tree Area

"Shining Tree mineralized area lies east of Shining Tree lake in Leonard township. The known veins are confined to about four square miles of a diabase sill that overlies Keewatin and Huronian rocks. A considerable number occupy wide and persistent fissures frequently in parallel N.-S. series, and a few contain silver.

Archibald Claim

"The diabase underlying the property is traversed by a group of three parallel N.-S. veins, the outermost of which are 80 feet apart. They vary in width from one to three inches, and are stripped for distances varying from 60 to 160 feet in length. Small flakes of silver can be seen at two points along the most easterly one, and a little specularite, chalcopyrite and cobalt bloom occur in all three.

Caswell Claims

"A similar group of parallel but less regular veins striking N. 15° E. intersect the diabase on this property. When visited in August, a vertical shaft had been sunk 92 feet beside one of the veins, at the surface of which a little native silver had been found.

Rosie Creek Area

"Rosie Creek area includes adjacent portions of Unwin and Browning townships on either side of Rosie creek, a small tributary of Wanapitei river. It consists of a flat sand plain, above which rise occasional hills of Lorrain quartzite or of diabase. The veins that have been found, though of good size, are crooked and contain a somewhat typical mineral assemblage. Silver has not been recorded except in traces, determined by assays. Smaltite and cobalt bloom occur, but chalcopyrite and galena are more common, and slender prisms of stibnite are present in one vein."†

*Florence Lake and Montreal River Districts, W. H. Collins, Summary Report, Geol. Survey, 1909, p. 168.

†Geology of Onaping sheet, Ontario, portion of map-area between West Shining Tree and Onaping Lakes, W. H. Collins, Summary Report of the Geol. Surv. Branch of the Department of Mines, Canada, 1911.

TOWNSHIP OF LANGMUIR, PORCUPINE AREA

By A. G. Burrows

"The property of the Premier Langmuir Mining Company is situated in the township of Langmuir, along the south boundary and immediately west of Night Hawk river. On the property is a prominent ridge of Archean rock, which rises about 125 feet from the surrounding drift. The rock enclosing the veins is principally Keewatin greenstone schist. To the south there is intrusive reddish syenite in some volume. Narrow dikes of syenite cut the greenstone, and both rocks are cut by veins of barite. These veins occur along the northeasterly slope of the Archean hill. The

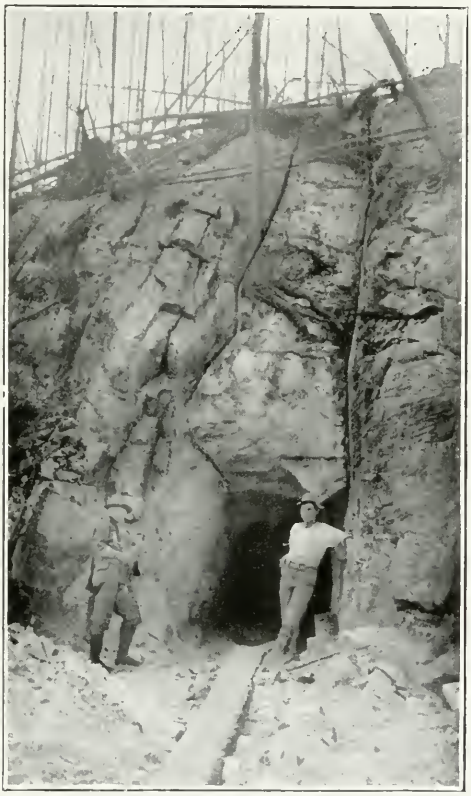

Fig. 94.—Barite vein on property of Premier Langmuir Mining Co., Langmuir township.

main vein has been traced about 1,000 feet in a direction somewhat south of east, while a branch vein has been followed about 350 feet with an E. and W. strike. The main vein would average from two to three feet in width, and at one place has a width of eight feet. A tunnel has been driven on the main vein at its westerly end a distance of 100 feet. The vein matter shows barite, with sparingly disseminated galena. Much of the barite is very pure in appearance, but portions of it contain calcite. About 500 feet east of the tunnel a shaft has been started on the branch vein, where it shows a width of 50 inches. Towards the south wall of this vein, where a cut had been made for the shaft, there are a few streaks or bunches of dark minerals. These consist principally of black or brown zincblende and galena, and in addition there are scattered flakes of native silver and argentite. Iron and copper pyrites also occur sparingly. It was noted in the pit on the east vein that the barite was cut by some minute veinlets of quartz, along which most of the sulphides occur. This would

suggest that the sulphides, along with the silver, came in with the quartz. Fluorite has been obtained in some narrow cross veinlets from the larger vein. The barite veins have well-defined walls, and the filling breaks freely from the wall rock. A quantity of commercial barite could be obtained from these veins.

"No smaltite or bloom was seen in the vein matter, but bloom was obtained about one mile to the west. Some small areas of diabase occur in the vicinity, but not immediately near the Keewatin area in which the veins are found."*

OTTER TOWNSHIP†

Occurrence of Cobaltite and Native Bismuth

By A. G. Burrows

The township of Otter is seventeen miles north of the town of Thessalon, which is on the north shore of lake Huron.

On the Kerr claim, S.E. $\frac{1}{4}$ of S. $\frac{1}{2}$ lot 1, con. 4, there are two quartz veins which strike N. 65° W. The northerly vein, which at one point has a width of 12 feet, contains copper pyrites and specular iron ore, in addition to the quartz and calcite. The southerly vein has been stripped over a distance of 230 feet, and at one place a pit has been sunk 13 feet. In the pit the vein is 7 feet wide, consisting for the most part of quartz, or quartz and diabase in a reticulated structure. Calcite occurs in lesser amount and cobaltite and native bismuth have been found in small masses. To the east and west of the pit the vein is much narrower.

On the adjoining claim to the east there is a quartz vein with a similar strike averaging a foot in width. It has a decided comb structure, some of the quartz crystals being an inch in diameter. Calcite and occasionally cobaltite and native bismuth have been deposited between the quartz layers, and thin sheets of bismuth sometimes occur on the smooth faces of the quartz crystals.

One sample from the Kerr claim, consisting mostly of bismuth, gave on assay: gold, .03 oz.; silver, 15.9 oz.; bismuth, 59.5 per cent.; cobalt, trace. A sample of massive cobaltite gave on assay no gold or silver.

The rock enclosing the veins is quartz diabase. It occurs over a number of claims and shows differentiation to acid phases.

Under the microscope a sample of dark grey diabase shows the feldspar greatly altered to saussurite, while the pyroxene is almost wholly changed to green hornblende, uralite. Quartz is abundant in grains and in micrographic intergrowth with feldspar.

An acid differentiation of the diabase occurs about one-half mile to the south. It contains greenish laths of plagioclase and also a reddish feldspar, which is intergrown with quartz, giving a red color to the rock. The dark minerals are green and brown hornblende, and chlorite.

Ridges of a coarse boulder conglomerate and a reddish granite were observed near the diabase.

The diabase evidently occurs as a sill, and may correspond to the Nipissing diabase at Cobalt.

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*Twenty-first Report, Bur. of Mines, 1912, Part I., pp. 248-249.

†Otter township lies north of the town of Thessalon, about 190 miles southwest of Cobalt.

CHAPTER III

1. LAKE SUPERIOR SILVER DEPOSITS

The Silver Islet mine and the silver mines on the main shore to the southwestward of Port Arthur are well known to students of ore deposits. In richness of silver they resemble those of Cobalt station, but they contain a much lower percentage of cobalt, nickel and arsenic. Cobalt bloom and nickel bloom, together with arsenides and other compounds, were, however, found in these lake Superior deposits with the silver. A similar assemblage of minerals, but in a much smaller quantity, was briefly described years ago as occurring on Michipicoten island.* It is well known that native silver occurs in association with native copper in the great copper mines of Michigan on the south shore of Superior. It would seem then that native silver is not a very rare mineral in the region between the Quebec boundary and the north and south shores of Lake Superior. Port Arthur, however, lies about 500 miles west of Cobalt, and in the intervening area no deposits of the metal have been found. There is ground for hope that deposits will be discovered when this area is explored. Little is known about much of it at the present time.

The Port Arthur Mines

Much has been written on the silver mines in the area adjacent to Port Arthur. This literature has been summarized and many additional details given in an important report written by Mr. E. D. Ingall of the Canadian Geological Survey.† None of these mines are now working.

It will be seen from the following notes, condensed from Mr. Ingall's report, that these Port Arthur deposits in many respects, especially in the facts that they occupy for the most part vertical fissures which cut slightly inclined pre-Cambrian beds, and in their mineral contents, resemble the silver-cobalt deposits in the vicinity of lake Temiskaming. The chief difference between the two as regards their mineral contents is that the Port Arthur deposits contain a higher percentage of gangue material, the ore usually occurring in bunches or pockets, and the percentage of silver is always much higher than that of the associated nickel and cobalt which generally occur in small quantities or are entirely absent in some of the deposits. Some of the veins in the vicinity of lake Temiskaming on the other hand contain a much smaller amount of gangue, and the percentage of cobalt, nickel and arsenic is often higher than that of silver. One of these veins, that in the north-west corner of R L 404, described on a preceding page, consisted as exposed at the surface of about 14 inches of solid smaltite together with niccolite. There was little gangue in this ore. The Cobalt station deposits, as previously stated, resemble, among veins which have been worked in the world, more closely those of Joachimsthal in Austria and Annaberg in Saxony than any others.

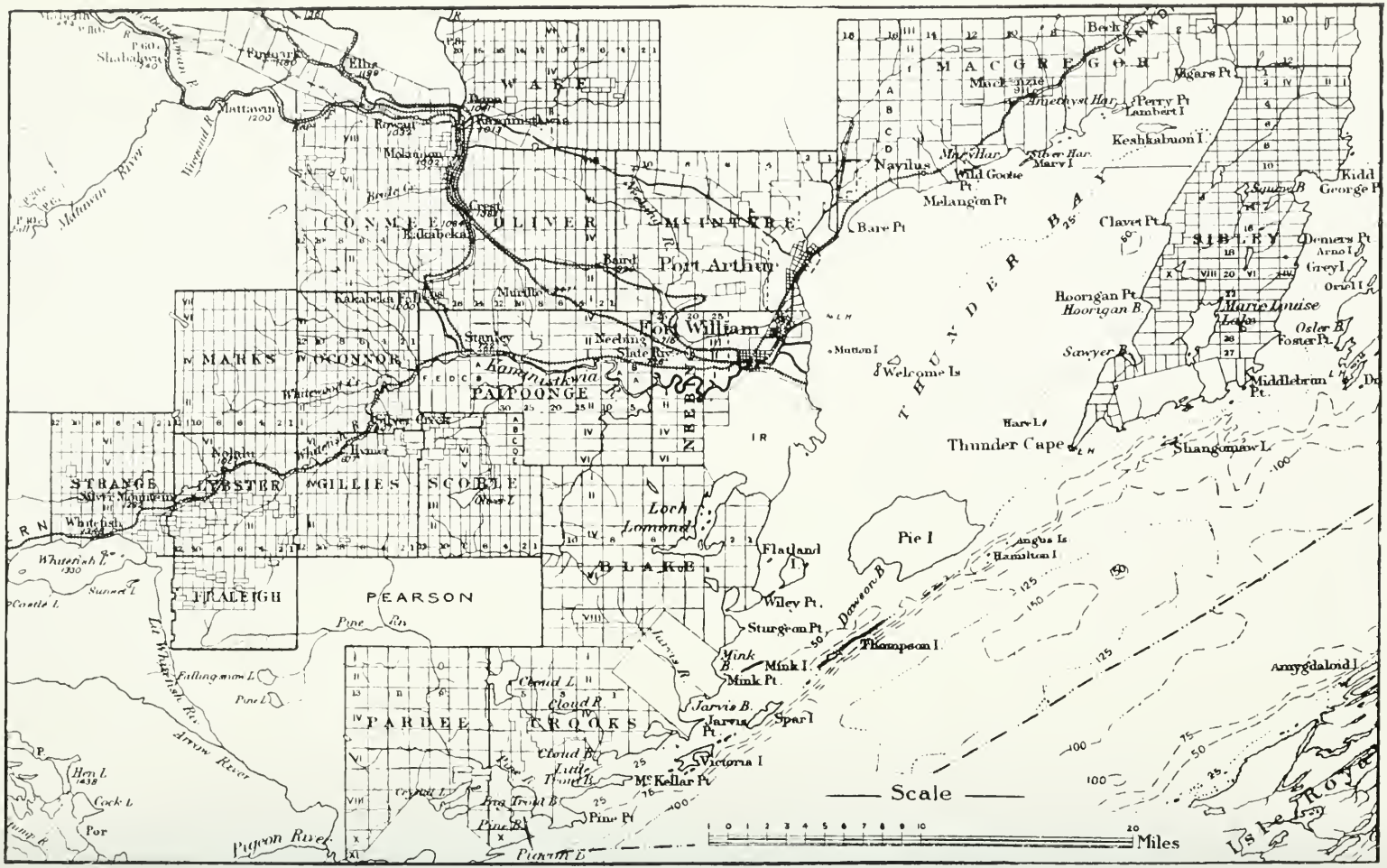
It is interesting to know, however, that nickel did occur in the Silver Islet mine, at least, in economic quantities. The first ores of this metal of this Province, which is now such an important producer of the metal, were those of the Silver Islet mine. Mr. W. M. Courtis, in a paper read before the American Institute of Mining Engineers, October, 1873, in speaking of the smelting works at Wyandotte, says that the matte was treated to save the nickel and that the silver was extracted from the marketable nickel speiss.

Ingall says the vein-filling minerals consist of quartz, barite, calcite and fluorite. In these occur various metallic minerals, viz.: blende, galena, pyrites of various species and occasionally some sulphurets of copper, whilst the silver occurs as argentite and in the native state, the former being the more common. At places the veins carry a dark green, probably chloritic, material, which on some surfaces has a bright waxy

* "Geology of Canada," 1863, pages 506 and 703.

† "Report on Mines and Mining on Lake Superior," by E. D. Ingall, Part H, "Annual Report of the Geological Survey of Canada, 1887," 124 pages, with colored geological map.

See also "Silver in Thunder Bay District," by N. L. Bowen, Part I, "20th Report Ontario Bureau of Mines, 1911," pages 119 to 132, with colored geological map, one mile to one inch.


Port Arthur
Fort William
Thunder Cape
Pie I
Scale
Miles
Lake Superior
THUNDER BAY
CANADA
Pigeon River
Arrow River
Loch Lomond
Jarvis B.
Dawson B.
Hoorigan B.
Sawyer B.
Mink B.
Cloud R.
Cloud L.
Pine R.
Pine Bay
Flatland I.
Thompson I.
Amygdaloid I.
Victoria I.
Spar I.
Mink I.
Wiley Pt.
Sturgeon Pt.
Bare Pt.
Welcome Is
Angus Is
Hamilton I
Shangoinaw L.
Keshkabuon I.
Navilus
Melangim Pt
Claver Pt.
Hoorigan Pt.
Middledrum Pt.
Foster Pt.
Osler B.
Marie Louise L.
Grey I.
Orvel I.
Demers Pt.
Arno I.
Squaw B.
George Pt.
Kidd
Perry Pt
Lambert I
Vigars Pt
Beck
Wild Goose Pt.
Marv I.
Silver Har.
Blue Devil Har.
Mack
Dixie
Mutton I.
Hare L.
Whitefish L.
Whitefish R.
Whitefish
Nolalu
Silver Mountain
Silver Creek
Kakabeka Falls
Kaministikwia R.
Slate R.
Neebing
Stanley
Murillo
Baird
Rosslyn
Mattawin
Shabaqua
Ella
Rossini
Melanson
Kakabeka
Birds G.
Wiseguard R.
Mattawin River
Falling moon L.
Hen L.
Cock L.
Por
Pine Pt.
Pine B.
Pine Trout L.
Trout L.
Little Trout L.
Trout R.
Trout Lake
Mc Kellar Pt.
Jarvis R.
Clearwater R.
Kaministikwia
Nipigon R.
Pigeon R.
Pigeon River
Pigeon Bay
Pigeon Pt.
Pigeon L.
Pigeon R.
Pigeon Lake
Pigeon Lake
Pigeon Lake

lustre, whilst occasionally a soft, greasy, talcose material, probably saponite, accompanies the ore, notably at the Beaver mine, and to a lesser extent at one or two other places. Carbon in various forms has also been found here and there, whilst in some of the vugs in the veins which have been found near the surface, stiff clay and ochreous material have sometimes been obtained along with nuggets of argentite, the former, however, having evidently been washed in from the surface and thus imbedded the silver minerals already existing in the vugs.

The same writer further states: "These, then, are the mineral constituents of these veins, but the Silver Islet vein forms somewhat of an exception in that it carried, besides these, various arsenical and antimonial ores of silver with compounds of nickel and cobalt and other metallic minerals which have so far not been found in the rest of the veins (?). Other salient features were the pink and cream-colored dolomitic spar which so frequently formed a characteristic and prominent constituent of the

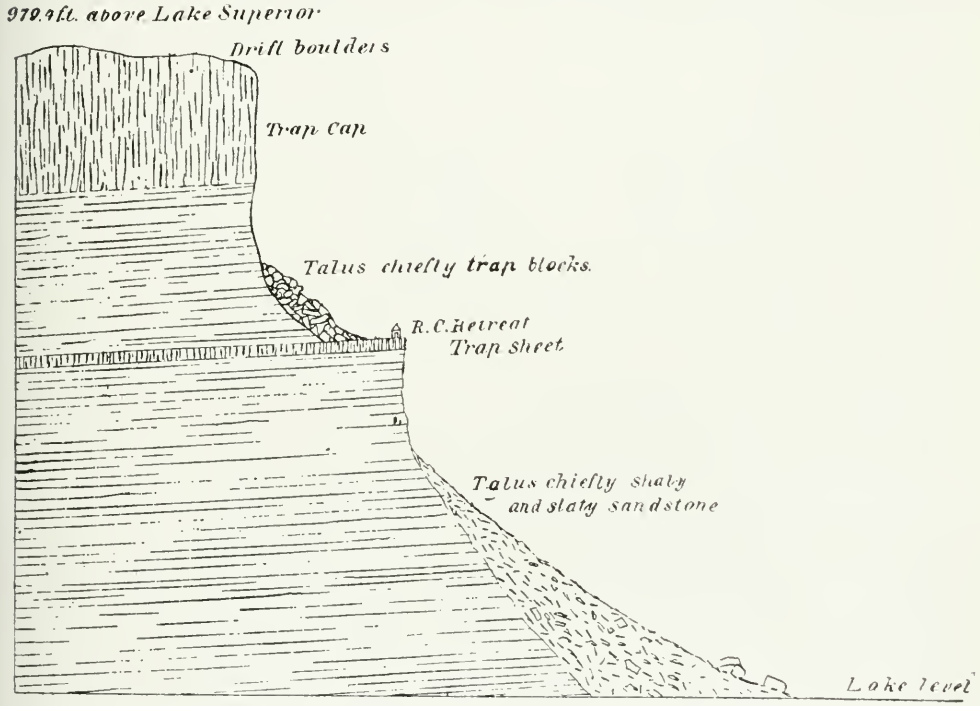


Fig. 96.—Section through Mt. McKay, near Fort William, Ont. The trap here bears a similar relationship to the slaty series to that which it has in the Cobalt area. Some silver veins in the Port Arthur area cut both the trap and slate. (After Dr. A. C. Lawson.)

gangue of the rich ore, and the predominance of native silver in the rich parts, whereas in the rest of the veins, though this form of silver occurs in considerable quantity in places, yet argentite seems to be the form in which it it generally found."

"Again, it is interesting to know that both the mineral waters and the inflammable gas that were met with in opening up the Silver Islet mine have also been encountered at other points in the district. At the Rabbit Mountain mine in one of the lower levels I saw water running over the breast of the drift which gave off a faint odor of sulphuretted hydrogen and was depositing a while flocculent material, whilst both at this place and at the Beaver mine I was informed that small quantities of inflammable gas had been met with."

These veins, like those of Temiskaming, frequently present a brecciated appearance, angular fragments of rock being enclosed in the vein material.

Ingall found the distribution of the silver minerals in the veins very irregular, the

Fig. 97.—Mill at the Beaver mine.

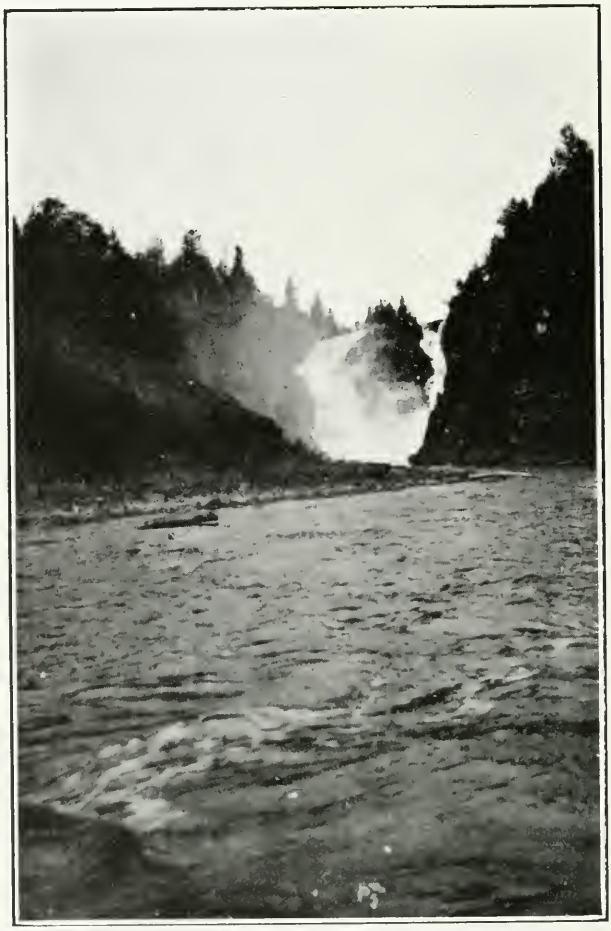


Fig. 98.—Kakabeka Falls and Gorge in Animikie strata.

rich ore generally occurring in detached bodies of varying dimensions surrounding very poor or quite barren areas of the vein.

As regards the metallic minerals, it was observed by Ingall that the blende comes first in importance, being the most plentiful. This mineral is practically absent in the Temiskaming deposits. The galena does not play such an important part, Ingall says, as the blende. Pyrite is found to a lesser extent than the two last mentioned minerals. Both pyrite and galena are likewise rarely met with in the Temiskaming veins. Marcasite and pyrrhotite are found in the Port Arthur veins, but copper compounds represented by chalcopyrite and copper-glance are rare. Through the blende, galena and pyrite, or through the gangue minerals, are distributed the argentite and native silver. It is said that, with the exception of Silver Islet, the native silver is more characteristic of the ore bodies near the surface and is replaced by argentite in depth. The likelihood of blende, galena and pyrite carrying silver is asserted to be in the order in which they are here named. Silver was found in but few specimens. Traces of gold were obtained in these minerals, in a few instances.

The calcite is said to be apparently older than the quartz, and there is also some secondary calcite. The silver minerals seem to be due to a later infiltration of silver-bearing waters subsequent to the deposition of the gangue minerals.

Regarding the source of the silver minerals Ingall does not offer any definite theory. He says some writers have thought them to be connected with the trap eruption, the silver being brought up by thermal waters accompanying these intrusions. He points out, however, that these fissures intersect and dislocate the trap sheets and dikes. He adds that the fact remains that all the ore bodies occur near or within a reasonable distance of trap in some form, either in dikes or in sheets. This suggested the idea to him that the silver may be derived by decomposition of some of the mineral constituents of the trap carrying minute quantities of silver. On decomposition, waters infiltrating downwards through the fissures might have deposited their silver contents in them. He thinks that the various forms of carbon present in the sedimentary rocks may have had some influence in effecting this precipitation.

Silver Islet Mine

This deposit, which occurs on an islet, less than 80 feet in diameter, about a mile out in the lake off Thunder Cape, was discovered in the summer of 1868. It is the most famous silver mine worked in Canada, till the discovery of the Cobalt camp, the silver produced from it amounting in value to $3,250,000. The vein on this islet intersects what is called a chloritic diorite dike in its course through the sedimentary beds of the Animikie. The producing part of the vein was practically confined to that portion between the walls formed of the dike material.

We shall not attempt to give a fuller account of this vein here, but shall refer the reader who wishes more details to Mr. Ingall's interesting report. It will be well, however, for the purpose of comparison, to give a list of the minerals found in this vein. Among these are the gangue minerals, calcite, quartz and dolomite, the latter varying in color from cream to pink according to the amount of manganese contained. A variety known as rhodochrosite is said to have been found. The metallic minerals are native silver, argentite, galena, blende, copper and iron pyrites with marcasite, tetrahedrite, domeykite, niccolite and cobalt bloom, together with a mineral known as macfarlanite containing arsenic, cobalt, nickel and silver. Two new minerals are said to have been found in the ore; these were called huntilite and animikite, which with macfarlanite, according to one writer, were the principal producing silver ores of the mine. There were also found, annabergite, antimonial silver and cerargyrite, the latter "where the rock has been decomposed." Graphite is said to occur in quantity. A curious feature of the vein was the combustible gas met with in large quantities in the workings and the mineral water which carried considerable amounts of chloride of sodium and other metals. Two very rich bunches or bonanzas of ore were found in the vein. One of these was completely worked out in 1874, yielding over $2,000,000. The shape of this

bonanza was that of an irregular pear, and throughout its extent in both veins, that is the main and branch vein, it was accompanied by a strong impregnation of graphite. The bulk of this bonanza was arborescent silver, more or less mixed with macfarlanite, a rich ore of silver carrying 78 per cent. of that metal along with arsenic, cobalt and nickel. Its physical structure resembles niccolite.

In drifting south on the third level in 1878, strong impregnations of graphite were met on the hanging wall which were soon followed by the second bonanza. This deposit of silver was remarkable for its great width, five feet solid across the breast, and the occurrence in great quantity of the two previously unknown compounds of silver, animikite and huntilite. The shape of this bonanza was that of an inverted cone with a base of about 50 feet in the third level, with the apex down as far as the fifth level. This deposit was phenomenal in its structure, and a winze in the middle of the deposit to the fourth level, 60 feet, was sunk literally through native silver, the metal standing out boldly from the four walls of the winze. In the breast of the drift it stood out in

Fig. 99.—Silver Islet, with mine buildings, in the distance.

great arborescent masses in the shape of hooks and spikes, in gnarled, drawn out and twisted bunches, followed by arborescent silver with intercalated bands of animikite and huntilite. The width of the vein was over 10 feet, and the entire deposit, including the stamp rock, yielded about 800 000 oz. of silver.

While the vein continued to the greatest depth reached in the shaft, over 1,200 feet, little ore was met with in the lower workings, no silver being obtained from great stretches of vein material.

To give an idea of the richness of the ore produced from this vein in the earlier part of its history, it may be said that the 1,154,537 lbs. of ore produced up to the season of 1872 averaged $1,322.44 per ton. Silver then sold, however, at more than twice its present price.

Ores of other Lake Superior Mines

In order to show the character of the minerals found in other deposits of the Port Arthur area we may cite the following examples given in Ingall's report. Argentiferous blende was the chief silver-bearing ore of the vein on McKellar's island. On Spar island the metallic minerals were copper glance, copper pyrites, zinc blende and a little argentite (Fig. 104). Prince's mine, the oldest mine on the Canadian shore of the lake, having been worked in 1846 or 1847, appears to have been regarded more in the light

of a copper than of a silver-bearing vein. It contained native silver disseminated in thin laminæ through the calcareous spar and blende. Argentite was also found in this vein, and the calcareous spar was stained with blue and green carbonates of copper and with arseniate of cobalt. The vein on Pie island contained blende, galena and iron pyrites.

The veins so far mentioned belong to what Ingall calls the Coast group. In the second or Port Arthur group he says the silver veins may be considered in two divisions: (1) Those which occur in the Animikie rocks; (2) Those occurring in the Archean area to the north of the former. Most of the veins are contained in the first division. A number of veins are described by Mr. Ingall under this heading. The Shuniah or Duncan mine is interesting owing to the fact that the vein here passes downward from the Animikie rocks into the underlying Archean, which consists of what are called diorite, syenite, felsite, etc. It is said that no silver was found in that part of the vein

Fig. 100.—Silver Islet, main shaft of mine.

contained within Archean walls. At the 3A mine the gangue was mostly quartz with a little calcite, through which were distributed ores of iron, copper, lead, zinc, nickel and silver, with some cobalt and gold as shown by the assays. The silver was found native and combined with sulphur and nickel. One sample of the ore is said to have assayed 1.4 per cent. of cobalt and 25 per cent. of nickel. This vein was in what Ingall called the Archean or Huronian, the rocks being gray dolomitic schists associated with dark-green compact diorite, whilst dark grayish red, felsitic syenite occurs a short distance to the south. Near 3A mine was a vein containing two feet of milky quartz, which is interesting on account of the fact that it was said to carry native bismuth, the only mention made of this mineral, which occurs in most of the Temiskaming deposits. The Emmons' mine, on lot A in the township of McIntyre, is said to have contained mispickel, another mineral which seems to be rare in the vicinity of Port Arthur.

Rabbit Mountain Group

This group of mines, which was discovered a number of years after the Silver Islet and other veins of the Coast group, is said by Ingall to present somewhat different conditions of occurrence from those just mentioned. The veins are all in the Upper argillaceous division of the Animikie with its associated trap sheets. The ore of the Rabbit Mountain mine consists of native silver and argentite with other minerals. A special feature of the Porcupine mine, one of this group, is that it carries witherite, the carbonate of barium. In the Beaver mine there is the occurrence of saponite already mentioned.

The Silver Mountain group presents features similar to those of the group just referred to. The veinstones are calcite, barite and quartz with fluorite. The enclosing rock is argillite. The metallic minerals are represented by blende, both light and dark-colored, galena and iron pyrites, with occasionally a little copper pyrites, the silver occurring both native and as argentite.

Fig. 101.—A Miner of Silver Islet.

Woodside's vein differs from the others in the area in that it occurs in the Archean granitic and gneissic rocks underlying the Animikie. The vein in its nature and contents is very similar to the rest, and carries blende, galena and pyrites distributed through the usual gangue in moderate profusion.

There is also what is called the Whitefish Lake group. The veins here mostly occur in the lower silicious rocks of the Animikie. They have much the same contents as the preceding ones.

The map, page 198, shows the townships along the Port Arthur, Duluth and Western Railway, in which are situated the mines, that with the exception of Silver Islet were the most important producers. There were the Beaver in O'Connor, Silver Mt. in Lybster, Badger and Porcupine in Gillies, and Rabbit Mt. in Scoble. The discovery of the Rabbit Mt. vein in 1882 led to the prospecting of this area. Mining was carried on systematically for about ten years.

Minerals of Port Arthur Veins

With the object of comparing the minerals of the Port Arthur silver mines with those of the Temiskaming veins, the following table has been prepared from the minerals mentioned by Ingall as occurring in the former:

I. Native elements:
Native silver, native bismuth, graphite.

II. Arsenides:
Niccolite, domeykite, macfarlanite (?), huntilite (?).

III. Arsenates:
Cobalt bloom, annabergite.

IV. Sulphides:
Argentite, zinc blende, galena, pyrite, marcasite, pyrrhotite, chalcopyrite, copper glance.

Fig. 102.—Silver Islet, Main Shaft and office.

V. Sulph-arsenide:
Mispickel.

VI. Antimonide:
Animikite.

VII. Sulph-antimonide:
Tetrahedrite.

VIII. Chloride:
Cerargyrite.

IX. Carbonates:
Malachite, azurite, witherite.

The vein filling materials are quartz, barite, calcite, dolomite, rhodochrosite and fluorite. Chlorite, saponite, inflammable gas and mineral water were also found. Mercury was found in the Silver Islet ore.*

*T. Macfarlane, "Am. Inst. M. E.", Vol. VIII, 1879-80, page 238.

Many writers appear to have held that the trap or diabase and gabbro which overlies the Animikie rocks in this region represented a vast surface flow. In a paper published some years ago Dr. A. C. Lawson showed, however, that this trap, together with the layers of the same material which lie at a greater depth in the Animikie, is intrusive in character (Fig. 96). His work proved that these traps are of the nature of intrusive sheets or sills, that they are not only younger in age than the Animikie, but that they belong to post-Keweenawan times.*

Of the diabase sills, Mr. N. L. Bowen says:† "The sills range in thickness from a few feet to five or six hundred feet. The evidence for their laccolithic nature is scanty because of the removal of overlying sediments, but in a few places small patches are left in such an attitude as to indicate an arching of the strata. An example is shown on a hillside on R. 40, Scoble.

"The diabase is a fine-grained, dark rock, composed of labradorite and augite in ophitic structure, with some biotite, apatite, iron ores, and generally a little quartz. In one specimen from a small sill, quartz was absent and considerable olivine present. A few feet from an upper or lower contact the diabase commonly becomes porphyritic,

Fig. 103.—Table hill, illustrating structure.

showing phenocrysts of feldspar. The phenocrysts have in many cases collected into bubble-like masses, 2 to 10 feet in diameter, anorthosites in composition, but lacking sufficient size to be considered geologic units. It is possible that by an extension of this process bodies of anorthosite might be produced."

Spar Island Vein

An interesting description of some of the veins and associated rocks is given in an older report, as follows:‡

"To the southwest of the mouth of the Kaministiquia several mining locations have been taken along the coast. The most interesting of these is that known as Prince's Mine, where there occurs a remarkable metalliferous vein, which is seen both on the mainland and on Spar Island opposite. On the south side of this island the vein has a breadth of fourteen and a half feet; and from its whiteness it contrasts strongly with the wall-rock, which is a dark-colored slate holding cone-in-cone. (Fig. 104.) Its course is about N. 32°W. The greater part of the vein is here occupied by a coarsely crystalline calc-spar; but near the middle are two bands, each of about twelve inches, the one composed of heavy-spar, and the other of quartz, mixed with calc-spar. Between these is a band of six inches of calc-spar, which is the only metalliferous part of the lode, and contains small quantities of yellow and variegated copper ores with native silver. Two

*"Bulletin No. 8, Geological Survey of Minnesota," 1893.
†"20th Report Ontario Bureau of Mines," 1911, page 127.
‡"Geology of Canada. 1863, pages 707 and 708.

shafts, one of twenty-four and the other of forty-seven feet, were sunk here. On the mainland, about two miles distant, and a little way back from the shore, the vein reappears, somewhat split up; but a few rods farther to the northwest the parts reunite, and the vein is wider than on the island, and more quartzose, affording fine specimens of amethyst. It here contains small quantities of variegated and vitreous sulphurets of copper, with blende, and some native silver. A level was driven 165 feet in this vein, and at one place, in sinking a shaft of ninety feet, a bunch of several hundred pounds of ore was met with, which contained native silver disseminated in thin laminæ through

Fig. 104.—Spar Island Vein.

the calcareous spar and blende. This mass of rich ore was soon exhausted. Crystallized sulphuret of silver was also found in this vein; and the calcareous spar was stained with blue and green carbonates of copper, and with red arseniate of cobalt. Some further explorations were attempted after the discovery of this silver, but without success; and the mine has since been abandoned, although the characters of the lode are certainly such as should encourage further working for silver, if not as a copper mine. Adjoining this location to the westward is another in which the slates are intersected by large veins of calc-spar, sometimes associated with quartz, fluor-spar, and sulphate of barytes, and holding yellow and vitreous copper ores. At the mouth of the Pigeon river is

another location where numerous veins holding yellow and vitreous copper ores are met with, sometimes associated with blende."

Production of Port Arthur Area

Year.	Value.
Prior to 1887	$3,349,338 00
1887	190,495 00
1888	208,064 00
1889	162,309 00
1890	166,652 00
1891	221,120 00
1892	36,072 00
1898	51,960 00
1899	65,575 00
1900	96,367 00
1901	84,830 00
1902	58,000 00
1903	8,949 00
Total	$4,699,731 00

Fig. 105.—Top of diabase sill, showing contraction dikelets, lot 10, con. 1, township of Gillies.

Mr. W. A. Preston, M.P.P., has estimated the production of the individual mines as follows:

Silver Islet	$3,250,000 00
Silver Mountain, East and West	500,000 00
Beaver	550,000 00
Badger and Porcupine	300,000 00
Rabbit Mountain	50,000 00
Thunder Bay	20,000 00
Shuniah	50,000 00
3A. and Beck	10,000 00
Jarvis Mining Co.	40,000 00
Total	$4,770,000 00

It is thus seen that compared with Cobalt the production of the Port Arthur area was small.

Michipicoten Island*

The following notes on the occurrence of native silver and arsenical ores on Michipicoten island, lake Superior, are of interest. The occurrence resembles some of those in the copper mines of Michigan.

"The island of Michipicoten may next be noticed. On the north side of this island there is a considerable mass of greenstone and amygdaloid interstratified with sandstones, the whole dipping eastwardly. Towards the west end of the island, the rocks present a low surface for a breadth of four or five hundred feet, and then rise into a cliff two or three hundred feet in height, in which the greenstone is marked by druses containing analcime and quartz. A soft amygdaloidal bed holding native copper, is traceable for some miles along the shore, sometimes beneath the surface of the water in the bays, and again running a little distance inland. In this bed in the North Bay, an attempt was made, a few years since, to work a remarkable deposit of native copper and silver, which were found disseminated in grains through a green hydrous silicate of nickel. The ore being stamped, the nickel, whose value was not suspected, was washed away from the residue of native metals, which gave, in one trial, twelve parts of silver and eighty-eight of copper. A shaft was sunk here to a depth of seventy feet; but after a considerable outlay, the working was abandoned. Nothing very definite is known as to the mode of occurrence of this curious metallic deposit, which is stated, however, to have been associated with calc-spar. From the same mine were said to be obtained the specimens of mingled arseniurets of nickel and copper, which, with the preceding nickeliferous ore, are noticed on page 506, and again on page 737. At a point near the west end of the island, and about seven miles from the working just mentioned, the cupriferous stratum again appears, and fragments of the native metal are scattered along the shore. Mining operations on a small scale were undertaken here ten years since by the Quebec Mining Company, and a shaft was sunk at a little distance from the shore, in which the copper-bearing beds were reached at a depth of fifty-five feet. The mine is now leased to Mr. Hugh R. Fletcher, who is engaged in working it, and has kindly furnished the following particulars. Beneath the principal copper-bearing bed is a soft argillaceous rock known as an ash-bed, which is six feet, and perhaps much more, in thickness, and is underlaid by a massive greenstone. The ash-bed itself contains from one half to one per cent. of disseminated metallic copper, which it is supposed can be economically extracted by crushing and washing the soft rock. Upon this reposes the principal copper deposit. The metal is found in a bed of greyish amygdaloid of from eight to eighteen inches in thickness, and an overlying bed of sandstone of from twelve to twenty-four inches; the united thickness of the two being on an average about three feet. The proportion of copper is the same in the two rocks, and averages two and a half per cent. The copper is in larger grains in the amygdaloid, and is sometimes surrounded by calc-spar; while in the quartzose sandstone it is in fine particles, or in filaments. Small specimens of the sandstone are occasionally found containing ten or fifteen per cent. of copper. This bed is overlaid by a massive compact greenstone, to which succeed amygdaloid and conglomerate. The dip of the copper-bearing stratum is about three feet in a fathom. Three shafts have been sunk upon it, one to sixteen fathoms, one to twelve and a half, and a third to eight and a half fathoms. From 300 to 400 tons of two and a half per cent. ore have been raised; and in the spring of 1863 it is proposed to commence operations on a larger scale, with proper machinery. Small portions of native silver and of vitreous copper ore have been found in this vicinity; and according to Mr. Willson native copper occurs in a second band of amygdaloid about a mile and a half south of Mr. Fletcher's mine, and 200 feet above the surface of the lake. Vitreous copper ore is also found with calc-spar and sulphate of barytes on the eastern extremity of the island, in a reddish porphyritic rock, over which occurs a pitchstone porphyry and pitchstone with veins of agate.

"The arsenical ore already described as occurring on Michipicoten island has been shown to be an intimate mixture of the arseniurets of copper and nickel; different por-

*"Geology of Canada," 1863, pages 703 and 704.

tions of the same mass containing from seventeen to thirty-six per cent. of nickel. These results have been confirmed by Prof. Whitney, who, on visiting this locality, found this ore in the form of nodules, having a concentric structure, and imbedded in coarsely crystalline calc-spar. These, according to him, were irregularly distributed in the trappean rock, and did not form a regular vein. He found in two specimens, respectively thirty-one and thirty-three per cent. of nickel. Of the second nickel ore from the same locality, already described as a greenish earthy silicate of nickel, and yielding about twenty-four per cent. of nickel, little is known, except that the specimens brought from the mine were filled with small grains of native copper and native silver; and that large quantities of the green earthy material were said to have been crushed and washed to obtain these metals, the valuable ore of nickel being lost in the process. The analysis of a specimen, from which the native metals had not been separated, gave for one hundred parts: silver 2.35, copper 18.51, and oxyd of nickel 20.85. At the present price of the latter metal it would be worth nearly as much as the accompanying silver."*

* "Geology of Canada," 1863, page 737.

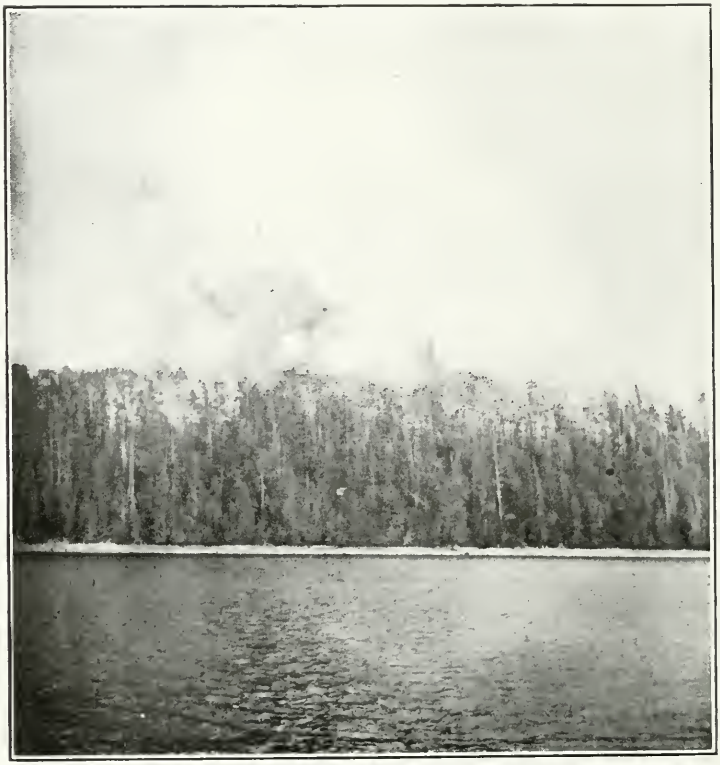


Fig. 105a.—Forest fire on the east side of Cobalt lake, opposite the railway station, June, 1905.

2. OTHER CANADIAN NICKEL-COBALT ORES

The following extract from the Report of the Geological Survey of Canada for 1890-91 summarizes the descriptions of a number of the occurrences of nickel and cobalt known in Canada at that time.

"It may not be amiss to draw attention here to certain other nickel and cobalt ores, or minerals containing a noteworthy amount of one or the other of these metals, which have from time to time been met with in Canada in the course of this Survey's work.†

"One of these, described as a steel-gray pyritous ore, from the Wallace mine on lake Huron, was found by Dr. T. S. Hunt to contain 13.93 per cent. of nickel. Of two others found on Michipicoten island, lake Superior, the one was shown by Dr. Hunt to be an intimate mixture of the arseniurets of copper and nickel; different portions of the same mass affording him from 17.03 to 36.39 per cent. of nickel, whilst the other, also examined by Dr. Hunt, proved to be a hydrated silicate of nickel which, after drying at 100°C., was found by him to contain 30.40 per cent. oxide of nickel, (equivalent to 23.91 per cent. nickel). The arsenide of nickel, which for present purposes may be regarded as consisting of 44.1 of nickel and 55.9 of arsenic, has also been found at the 3A mine, on lot 3A of the township of McGregor, district of Thunder Bay, where it occurs in somewhat large nodular grains and nuggety bunches, together with native silver, of a similar form, freely disseminated through a gangue of calc-spar with some quartz. The foregoing are all rich ores of nickel, and should the deposits on further exploration be found to yield a sufficiency of the material these would, as available sources of this metal, prove of economic importance.

"Less important, by reason of their occurring only in limited quantity or as containing but a relatively small amount of nickel or cobalt, are the following:—Millerite or nickel sulphide, a rich and valuable ore of nickel, occurs in small grains and prismatic crystals disseminated through a mixture of chrome-garnet and calc-spar in a vein on the east side of Brompton lake, in the township of Orford, Province of Quebec. It is also reported to have been observed, in the form of prismatic crystals, disseminated through certain portions of the nickeliferous ore of the Copper Cliff mine, in the township of McKim, district of Nipissing, Ontario. Erythrite or hydrous cobalt arsenate, a valuable ore of cobalt when met with in quantity, is mentioned by Dr. Hunt as occurring in rose-red incrustations on calcareous spar at Prince's mine on lake Superior. Smaltite, a cobalt arsenide, was observed by Mr. E. B. Kenrick in the form of minute crystals in a sample of copper pyrites (brought to the Survey for examination) from the township of McKim, district of Nipissing, Ontario. A sample of iron-pyrites from the seigniory of Daillebout, Joliette county, Province of Quebec, was found by Dr. Hunt to contain 0.55 per cent. of oxide of nickel (equivalent to 0.43 nickel) mixed with cobalt, and a brilliant compact variety of iron-pyrites from Elizabethtown, Leeds county, Ontario, yielded him from 0.5 to 0.6 per cent. oxide of cobalt (equivalent to 0.39 to 0.47 cobalt), whilst a sample of iron pyrites from Londonderry, Nova Scotia, was found by me (Rep. Geol. Surv. Can., 1874-75, p. 316) to contain 0.81 per cent. of cobalt and 0.14 per cent. of nickel."

The mineral danaite was found some years ago in developing nickeliferous pyrrhotite on the north half of lot 6, concession 3, of the township of Graham. Specimens of the mineral were found to carry about 4 per cent. of cobalt.

Cobalt bloom has also been found on magnetite at the Dominion mine and at the Cross mine, lot 2, in the second concession, in the township of Madoc, Hastings county.

In the western part of the Province the mineral occurs in small quantity at the southeast corner of the Bay of Islands, Bad Vermilion lake.

In the Report of the Geological Survey for 1848-9, page 61, T. Sterry Hunt has this to say concerning the ore of the Wallace mine at the mouth of the White Fish river, a partial examination only having been made of it:

†A more recent and fuller descriptive summary of the occurrences of nickel and cobalt minerals in Canada is given in the "Annual Report of the Geological Survey of Canada" for 1901, Vol. XIV, Part H, pages 147 et seq.

"The specimen was a mixture of a steel-gray arseniuret, the species of which I have not yet determined, with white iron pyrites and probably some arsenical sulphuret of iron."

The percentage of cobalt in this ore was slight, only a fraction of one per cent., while the nickel ran about eight per cent. He further says:

"The Wallace mine is the second place in which cobalt has been detected in Canada. I have already noticed it in the form of an arseniate of cobalt, forming reddish crusts upon calcareous spar, at Prince's location on lake Superior. In this locality it is associated with vitreous copper, green and blue malachite and native silver, while other parts of the same vein yield native silver, vitreous silver, blende and copper pyrites; in this connection it may be mentioned that a mass of silver ore selected by myself from some hundreds of pounds, as an average sample, gave on assay 3.6014 per cent. of silver, equal to 72 lbs. to the ton of ore. A portion of the silver extracted by a furnace assay from this ore was found on examination to contain a small portion of gold amounting to about one part in 7,000 of silver."

Speaking at this early date Hunt made the remark which, after a lapse of a lifetime, reads like a prophecy: "The detection of a small portion of cobalt in association with these metals upon the shore of lake Huron should lead us to look for deposits of this rare and valuable material."

Fig. 105b.—Cobbing and sacking ore at the La Rose mine, November, 1904.

3. FOREIGN COBALT DEPOSITS

GERMANY AND AUSTRIA

Known deposits of cobalt-silver ore in other countries which resemble, most closely, those in the vicinity of Cobalt station, are found in Germany and Austria. The two areas in these countries, to which special reference may be made, are those at Joachimsthal and Annaberg. Mining was begun in the former at the end of the fifteenth or in the early part of the sixteenth century. The deposits of the latter, it is said, were discovered in 1492, a year which possesses special interest for inhabitants of this continent, for then Christopher Columbus first sighted its shores.

The ores of those two regions are similar to those of Ontario, and include compounds of cobalt, nickel, bismuth and silver, with the ore of uranium, which has not been found in the Ontario deposits. With these are silver ores of various kinds. The rocks belong to the older systems, but are different in composition from those of Cobalt.

An outline of the history of the cobalt industry at Schneeberg, another German area which contains ores similar to those of Cobalt, Ontario, is given in an appendix to this Report.

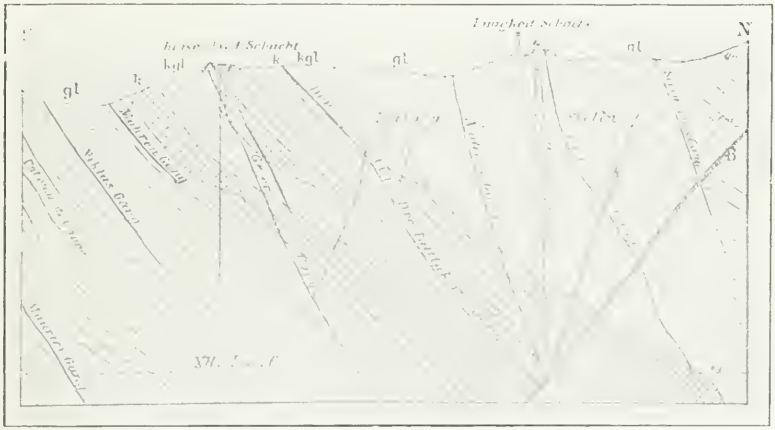


Fig. 106.—Vertical section through the Kaiser Josef and Einigkeit shafts at Joachimsthal showing several narrow veins (gang), and dikes of diabase (B). The veins in mineral contents, size and distribution resemble those of Cobalt, Ont. (After Babanek-Beck.)

At Joachimsthal, in Bohemia, there is a series of mica schist, calc schist and limestone which is cut through by dikes of basalt. The veins are said to be older in age than the basalt and cut all of the other rocks mentioned. The veins are narrow and contain quartz, hornstone, calcite and dolomite as gangue material, and they often show a brecciated structure.* The minerals in these veins are embraced in the following list:

(1) Silver ores (native silver, argentite, polybasite, stephanite, tetrahedrite, proustite, pyrargyrite, sternbergite, argentopyrite, besides rittingerite, acanthite and cerargyrite).

(2) Nickel ores (niccolite, chloanthite, millerite).

(3) Cobalt ores (smaltite as well as bismuth-bearing linnæite and asbolite).

(4) Bismuth ores (native bismuth together with bismuthinite and bismuth ochre).

(5) Arsenic ores (native arsenic, arsenical pyrites).

(6) Uranium ore (uraninite or pitchblende).

With these are galena, zincblende, pyrite, marcasite, copper pyrites and others.

Among these ores those of cobalt and nickel are generally the older; those of silver the younger. The veins cut through dikes of quartz-porphyry, and are in turn cut across by basalt and later dikes.

* Beck: "The Nature of Ore Deposits." Beyschlag, Krusch and Vogt: "Die Lagerstätten der Nutzbaren Mineralieu und Gesteine." Stelzner-Bergeat: "Die Erzlagerstätten."

Of similar composition to those of Joachimsthal are the veins of Annaberg in Saxony. In this neighborhood the rock is gray gneiss. There are two groups of veins in the district, the younger carrying the silver-cobalt ores. These are the most important of the ore bodies. The gangue material is chiefly heavy-spar, fluor-spar, quartz and brown-spar with various cobalt, nickel and bismuth ores, namely: chloanthite, smaltite, red and white nickel pyrites, annabergite, native bismuth, rarely bismuthinite. Of the silver ores there are pyrargyrite, proustite, argentite, native silver, silver chloride, and finally iron pyrites. The subordinate minerals are the gangue materials, hornstone, chalcedony, amethyst, calcite, aragonite, kaolin, gypsum; among ores are copper pyrites, galena, zincblende, marcasite, tetrahedrite, siderite, uraninite, uranochalcite, uranochre, gummite, native arsenic.

The great amount of chloride of silver, which was mined on a large scale at one time, is interesting. The structure of the veins is irregular.

From more than 200 observations which have been made the following is given as the relative ages of the various minerals of the Annaberg veins:

V. Decomposition products, for example, annabergite and cobalt bloom.
IV. Silver ores and native arsenic.
III. Calcite and uraninite.
II. Brown-spar and cobalt-nickel-bismuth ores.
I. Heavy-spar, fluor-spar and quartz.

The silver-cobalt veins cut across the older tin and lead veins of the district as well as the dikes of microgranite and lamprophyre. The latter, especially, is often cut by the silver-cobalt veins. These are cut by basalt, which occurs not only in true dikes, but also in boss-like forms.

Somewhat similar silver-cobalt ores are found in certain veins at Schneeberg, but they are not so strikingly like those of Temiskaming, in mineral composition, as are those of Joachimsthal and Annaberg.

A like association of ores is found at Wittichen, where the veins occur in granite.

In 1904 only one cobalt-silver mine in Germany had a production worth consideration. This is in the Schneeberg field. Its output was valued at about $132,147. The values were in silver, cobalt, nickel, bismuth, arsenic, uranium, samples, etc. The works in which these ores are treated in Germany are at Schneeberg and are known as the "blue color works." Both the government and private companies are interested in the industry. (See appendix III.)

According to Von Cotta, the Joachimsthal district consists of mica schist, together with more or less hornblende schist and crystalline limestone, the whole being cut by numerous dikes of quartz-porphyry and basalt. There are also two large granite masses which rise out of the mica schist. There are lodes of tin, silver and iron. Tin lodes are found only in the granite region. Silver lodes are divided into four groups tolerably distinct from one another. One set, which has a strike in a certain direction, contains about 17; another set has 21 lodes. There are also lodes which do not come to the surface. Both classes of lodes are said by Von Cotta to intersect the mica schist, with all its subordinate strata, quartz-porphyry and often even the dikes of basalt and wacké. This author also says that there seem to be cases where dikes of the last have intersected lodes or have penetrated into their fissures, from which it may be deduced that the silver lodes were almost contemporaneous with the formation of the basalt in that their fissures in part follow the basalt dikes, in part are intersected by the basalt. At all events they stand in a certain genetic connection to the porphyry, which here is evidently of much greater age than the basalt. The subject is still somewhat obscure. The silver lodes have not yet been found in the granite. Other writers do not agree with Von Cotta, as they appear to claim that the basalt is younger than the veins.

The following notes are taken from Phillips' "Ore Deposits," p. 436. The mountains known as Erzgebirge lie on the boundary betwen Saxony and Bohemia. Joachimsthal lies on the Bohemian side, and is therefore an Austrian town, while Annaberg is in Saxony.

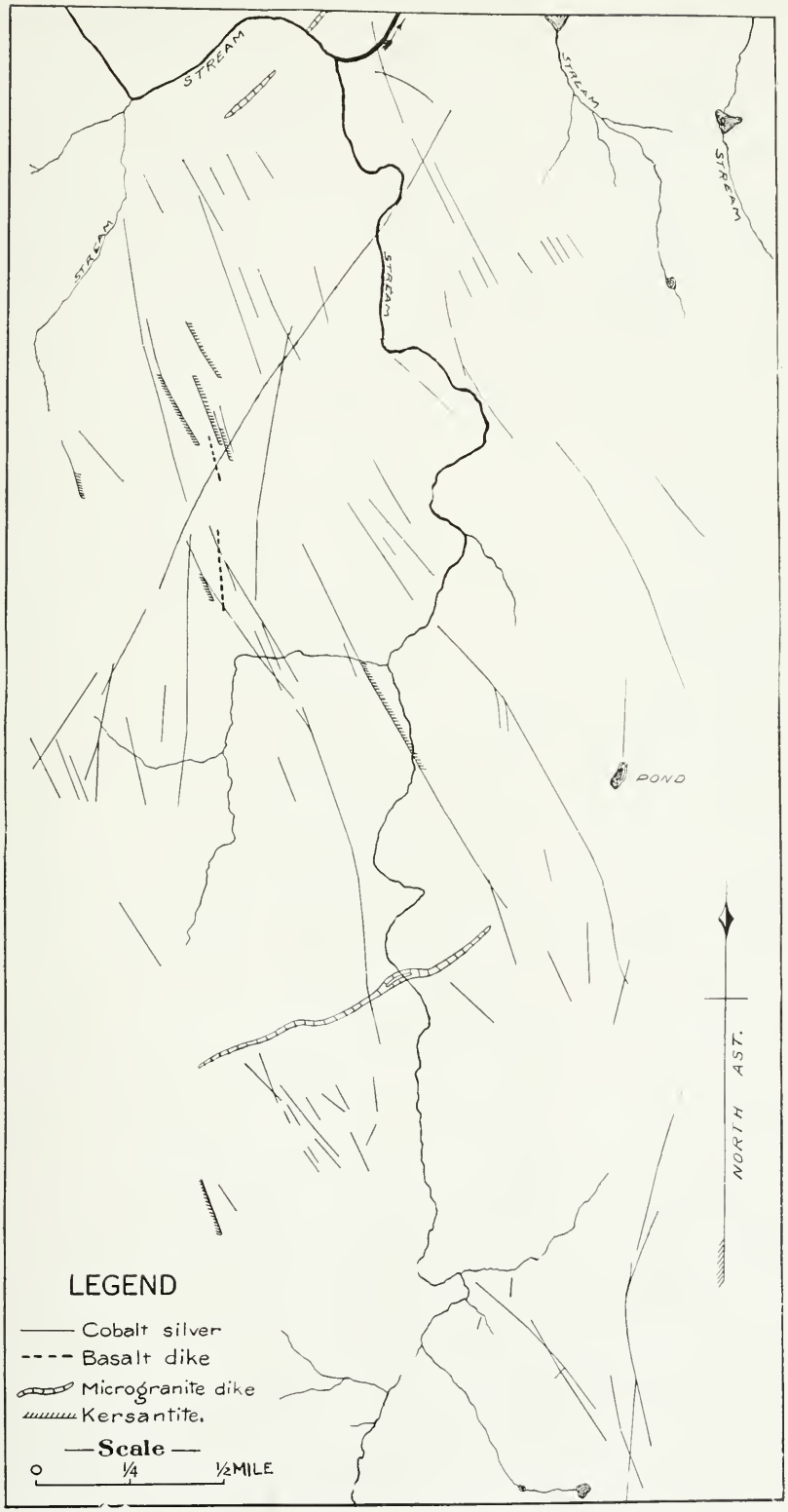


Fig. 107.—Map of part of the Annaberg area, Saxony. The thin lines represent the veins, the strike of which is more regular than of those at Cobalt.

The country rock in the neighbourhood of Joachimsthal is for the most part mica schist enclosed between masses of granite. In the eastern portions of the mine where there are some masses of included limestone, the lodes usually carry calcite as the predominating veinstone, but in the western part where the veins are not infrequently associated with dikes of porphyry, the gangue is almost entirely quartzose. There are seventeen veins striking north and south and seventen others of which the direction is east and west. It has been constantly observed that the former exhibit a tendency to become enriched where they pass through the porphyry or included limestone, while the latter set of veins are not similarly affected when they come in contact with these rocks. The ores raised contained values in silver, cobalt, nickel, bismuth and uranium.* In the eastern division of the mine there are two shafts situated about 260 fathoms apart, the Einigkeit's shaft and the Kaiser Joseph shaft (Fig. 106).

In 1864, when the former shaft had reached a depth of 280 fathoms, a heavy outburst of water, at a temperature of 25 C. and evolving sulphuretted hydrogen, took place and greatly interfered with undergound operations. It took two years before this water could be successfully tubbed off and mining proceeded with.

The character of the ore produced will be seen from the following statement made by Phillips:

During the period from 1877 to 1880 there were obtained 29⅓ tons of ore, containing 4,497 oz. of silver, 198 lbs. bismuth, 878 lbs. uranic oxide, 1½ tons arsenic and 314 lbs. of cobalt-nickel with a little lead, representing a total value of £1,687.

"About this time it became evident that the uranic oxide was the most valuable product of these mines, and workings were especially directed to develop the minerals yielding it. From 1881 to 1886 the average annual production was 38 tons of silver and uranium ores, worth about £6,520."

It is thus seen that these Joachimsthal veins, during late years at least, cannot be compared in richness with those of the Temiskaming district.

Cobalt, Annaberg and Schneeberg Compared

Number of Veins and Productiveness

The following interesting comparison of the veins at Cobalt with those of the old mining areas of Annaberg and Schneeberg is taken from a paper by Mr. George R. Mickle.†

"Let us compare the Cobalt district to the most productive silver districts in Europe, viz., Annaberg and Schneeberg, with regard to the number of veins. In order to do this intelligently, it will be necessary to understand the geological features, and also the industrial conditions under which the mining operations were carried on. Details of the mineralogical features of these European silver-cobalt veins are given in the report on the 'Cobalt-Nickel Arsenides and Silver' referred to before. The accompanying map of Annaberg is reproduced direct by a pantograph from the one attached to a monograph by Herman Müller (Die Erzgange des Annaberger Bergrevieres) and the information here is also taken mainly from the same source (Fig. 107).

"Briefly stated, the history of Annaberg was that after the first discovery in 1492 there was a rapid increase; in 1496 there were six mines paying dividends. The prosperous period lasted nearly fifty years, and the whole life of the district as a silver producer about one hundred years. It must be remembered, however, that no mechanical power was used and no powder in the mining operations, although it was long in use in warfare, and the rate of progress was probably only one-fifth, or even less, as rapid as it would be now. As a compensation wages were low, and the value of silver was very nearly three times as great as it is now, viz., $1.46 per ounce.

"A word as to the mode of operation will be in place. After a few successful ven-

* It is interesting to know that the uranium ores of Joachimsthal took on an additional value a few years ago, when it was found that uraninite was the chief commercial source of radium.

† "Journal of Canadian Mining Institute," 1910.

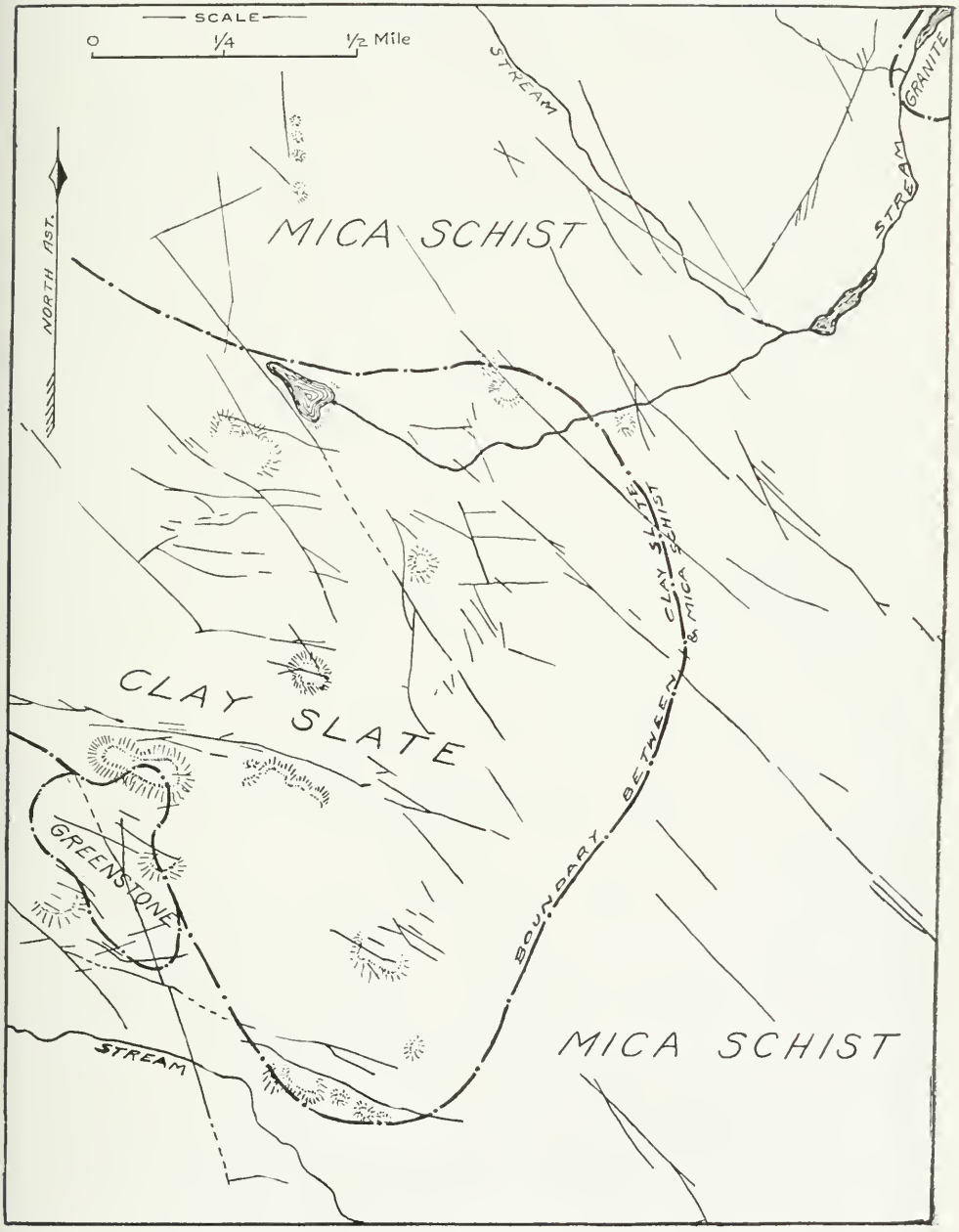


Fig. 108.—Map of part of Schneeberg area, Saxony. The thin lines represent the veins. Reproduced from map by H. Müller.

tures, a feverish mining speculation seized all classes of the community—town people and country people tried their luck. As soon as a vein was discovered, the exclusive right to work it could be obtained for a small fee from the mining office. It was the universal custom to divide the 'mine' into one hundred and twenty-five equal shares, to which were added four 'free' shares, one of which was given to the owner of the ground on which the discovery was made (that is all he ought to have), another each to the town, the hospital and the church. The silver produced from the rich ores was quickly converted into money at the mint, and the many fortunate enterprises attracted outside capitalists. The number of men employed as miners was about two thousand.

"The rock was soft, but very soon, as depth was attained, water began to give difficulty, and as there were no efficient pumps or means of ventilation, the work by shafts had to be abandoned. Fortunately, from the configuration of the ground long adits could be driven from the valleys to tap the veins. One system alone of these adits had a total length of sixteen miles. The maximum depth attained by any adit was about 700 feet.

"The term 'mine' was indefinite then as it is now, and as it will appear they were mostly small affairs; thus the records show that there were during the whole life of the district 635 mines that gave dividends; of these, however, over half, or 338, only lasted a year at most. The greatest number of profit-earning mines in any one year was 38, and the total number which produced silver was 969.

"The richest mine in the Annaberg district paid dividends in its best period at the rate of $220,000 per year. Sixteen of the leading mines are credited with a total dividend of about $1,850,000, and the whole sum paid in dividends amounted to $5,550,000, as far as recorded.

"From the information given the total silver production can only be very vaguely estimated. Cases are mentioned where dividends per ounce produced amounted to over one dollar, and about fifty cents per ounce profit is mentioned as the average of a number. It must be kept in mind also that it was the custom to divide whatever profit was made at once, so that, as soon as there was no profit, work had to be abandoned.

"Including good and bad, an average of twenty cents per ounce profit produced would give only about 28,000,000 ounces as the total production, and 50,000,000 would certainly be an extreme estimate.

"With regard to Schneeberg, which had a greater reputation, and was always spoken of as the greatest silver mining district in Germany, if there is any reliable information as to the production, the writer has not been able to find it. If we take it as 100,000,000, and it is more likely nearer 50,000,000, it would still be smaller than the probable total output of the Cobalt camp, which should not be less than 200,000,000 ounces. There is no doubt, therefore, that this greatly exceeds in actual amount of silver those older districts, although, of course, in value there may not be much difference.

"The Annaberg district proper embraced about twenty-one square miles. Generally taken with it were several outliers of small area. The total number of known veins was 215, and of these 152 were in the Annaberg area proper, but, as the records of more than 300 old mines were lost, it is certain that a number of veins are not included in the count. On the same ratio, as about 970 mines show 215 veins, 1,270 would show 290 veins, and of those about 200 would be in the Annaberg area proper of twenty-one square miles. This is equal to 336 claims of forty acres, or about .6 of a vein per claim. As we have seen, the Cobalt area of 2.90 square miles, or forty-six claims, has already disclosed sixty-six veins, or nearly 1.5 veins per forty acres, and has already far surpassed the Annaberg district in number of veins per unit of area.

"Looking at the map of the Annaberg district, an area of about eight square miles is shown with probably about 100 veins, this being the best part (only the cobalt-nickel silver veins are shown). It will be noticed that in many places the veins are grouped together. . . . A forty-acre claim could easily be placed on certain portions of the map to include five to ten veins, and also in many cases there would be blanks. Prac-

tically the whole area is taken up with one kind of rock—a biotite gneiss—the different dykes being so narrow that their area may be neglected. In a number of places kersantite dykes follow the veins. This can be seen at Cobalt, most easily at the large cobalt vein (No. 8) on R. L. 404, near Peterson lake.

"Coming to the Schneeberg district, according to Stelzner (Erzlagerstatten II, I. S. 738) 150 veins were found in an area of about ten square kilometres, or 3.8 square miles, or sixty-one claims of forty acres, or about 2.5 veins per claim. As on the Annaberg map, not all the veins are shown. About the centre the veins were massed very thickly. That is where the St. George mine was situated, which produced a larger nugget than any yet found in Cobalt. Notice the granite showing in the northeast corner. This was younger than the mica schist and clay slate in which the veins are found. A glance at the map shows that the slate and schist were equally favorable for finding veins.

"If the Cobalt area were equally productive in veins with the Schneeberg, then the number would be:—

$$\frac{2.9 \times 150}{3.8} = 114, \text{ approximately.}$$

"This is a difference of only about 14 per cent. in the number of veins in an equal area, considering the Huronian rock only. The estimate of the number in the Cobalt district cannot be expected to be closer than 10 to 20 per cent. ± of the actual truth. In the number of veins per unit of area, therefore, there is a striking resemblance between Schneeberg and Cobalt. It is not only in this respect that the similarity is seen; the way in which the veins occur in groups or clusters is also remarkable. Just as the values are concentrated in the veins in places, so the veins are concentrated in the country rock in certain spots, the degree to which this occurs being apparently about the same in the two districts. Thus about six productive veins on ten acres seem to be the maximum in both places; probably not over twelve or thirteen different veins fulfilling the conditions, as above mentioned, exist on any 40-acre claim. If the average number of veins for 40 acres is about three, and some have six or more, it follows that others must have none. How many there are of this kind at Schneeberg can be seen by subdividing the whole area into 40-acre claims. . . . This will give 63 claims, and of these eleven have no vein at all, and, therefore, were certainly worthless; and five more have such a short length of vein that they were probably worthless, or sixteen out of sixty-three, or say one in four, were valueless; three in four, therefore, were sure of success. It should be mentioned that about thirty of the veins are not shown on the plan of Schneeberg, this being a modern map produced from information gained in the period 1852 to 1893, when a determined effort was made to open up the mines at lower levels, in the hope that with modern appliances ore would be found which formerly could not be reached. This hope proved elusive; the old miners had taken out the best, and the results on the whole were disappointing. This plan shows everything projected on the plane of the lowest level. Veins not found on this level or which they did not try to find are missing therefore. If these thirty veins were distributed proportionately, it would reduce the number of the worthless claims by one-fifth, or make the chance of success about four in five. The length of the veins is, of course, a factor in this calculation, and it will be noticed that on the whole they are longer than in Cobalt, which would reduce the chance of success in the latter district somewhat.

"Up to the beginning of July, 1909, the number of productive veins appeared to have increased to eighty-four. It is difficult, however, to count within five or six of the correct number, as subsequent working proves sometimes that what appeared to be two separate veins is really one, and vice versa."

Chalanches, France

Somewhat similar silver, cobalt, and nickel ores occur in a network of narrow veins in crystalline schist at the Chalanches, in the Dauphiné, France. These deposits were discovered in 1767, and have had an interesting history. They were described some years ago by Mr. T. A. Rickard.*

The following extracts are from Mr. Rickard's interesting paper:

"In southeastern France, among the magnificent Alpine masses of the Dauphiné, there is a group of celebrated mines of silver, nickel and cobalt ores, the deposits of which present many features of interest. . . . .

"The discovery of these, as of many other notable mines, was accidental. In 1767, Marie Payen, a shepherdess (bergère) of Allemont, found an outcrop of silver ore, and brought away, in ignorant curiosity, a lump of heavy stone, which she handed to the village smith. When tested on his forge, the molten silver trickled from it. The shepherdess received 600 francs upon her wedding day as a reward for the discovery.

"The record of the Chalanches presents a story similar to that which is told of mines in more modern mining districts. The inaccessibility of the mines in winter, the richness of the ore, its great fusibility, and the consequent systematic robbery of the silver are local commonplaces. Circumstances all worked together to make the Chalanches mines the prey of the most barefaced plunder. With the aid of a common forge-fire, even without the intervention of a crucible, and with little knowledge or skill, lumps of silver could be produced from the very rich chlorides, ruby silver and black sulphides which constituted in the main the soft earthy ores or *terres* found in the crevices of the outcrop. Aged inhabitants still talk sportively of the theft like old smugglers and point out nooks in the woods, which the remaining ruins of the little furnaces dug out by the miners show to have been the scenes of former illicit silver-ore smelting. In these furnaces, no larger than an ordinary fire-place, dug in the earth and smeared with clay, with charcoal, or, failing that, clods of dung for fuel, and two or three little urchins to blow, like cherubs on the old maps, out trickled the white metal. Clergy and people joined cheerfully in these moonlighting operations without in any degree shocking local ethics. The priest at Allemont, who lately restored the parish church, says that the old church had a room adjoining the sacristy in which a former reverend father used to melt down silver-ore brought to him by the faithful. The slags were concealed in an excavation under the floor, where a large accumulation of them was found when the church was restored. . . . .

"During the earliest period of mining at the Chalanches, some bodies of extremely rich ore were found near the surface. It is said that two shots produced sufficient silver to pay for the two buildings known as the pavilions of Allemont, with their various ornamentations, including the *fleur-de-lis* which still adorn the roof. As 200 to 300 kilos. of silver would at that time be worth from $10,000 to $15,000, this statement does not seem incredible. . . . . .

"It is not a little remarkable that although the silver is always associated in the lodes with rich nickel and cobalt ores, often with bunches of stibnite, and more rarely and erratically with gold, the government engineers took no notice of any metal other than silver. None of the valuable metals mentioned figure in the old accounts. The speiss containing nickel and cobalt was rejected with the slags, and went to fill the swamps and to form the road-beds, which, in later times, were furrowed and turned over to recover their valuable contents. . . . . .

"The possibility of utilizing three metals instead of one seems to have dawned upon the engineers quite as a discovery; and this fact stimulated the repeated spasmodic attempts to rehabilitate the old mine. The arsenides of nickel and cobalt were sold in England and Germany. More recently, a German chemist was employed at Allemont in an experiment to manufacture cobalt pigments for the arts. He was not successful, and the attempt was abandoned.

*"Transactions of American Institute M. E.", Vol. XXIV.

"In 1891 the gold value was first recognized. Its importance proved greater from a scientific than from a commercial point of view. The old mine-workings, aggregating 20 kilometres in length, showed that a great deal of unsuccessful exploration had been carried out. Search among the galleries, particularly near the surface, resulted in the finding of certain rich bunches of ore, which were soon exhausted. An attempt to introduce the tribute or lease system was made, with partial success. . . . . .

The Ore Deposits

"The geological formation is simple. A network of veins traverses crystalline schists of very variable character. The country forms a part of the great crystalline formation usually referred to as the Archaic schists of the Alps, though in point of fact they probably include rocks from the granite up to the Carboniferous. Lithologically, certain sections suggest the Huronian and Laurentian. These schists lie immediately upon the granite; they are extremely variable in character, so that at different places they can be described as gneissoid, granitoid, talcose, micaceous, graphitic, or amphibolic. At the base of the slope leading to the mines there are superb blocks of rock containing crystalline epidote. . . . .

"The maps of the mine exhibit a wonderful network of galleries, spreading like a cobweb over an area of about 600 by 300 metres.

"It is computed that the workings aggregate in length not less than twelve miles, an extent in remarkable contrast to the relatively small quantity of ore produced. . .

"It has been thought by several observers that the lodes were more numerous near the surface than in the interior of the mine. This is due to the fact that any single fissure, in approaching the surface, spreads itself out into a number of subordinate fractures. It has also appeared that the lodes gained in regularity as they penetrated the mountain. Caillaux, therefore, adds that this fact seems to indicate the probable occurrence in depth of only a small number of lodes, but that those surviving will have a regularity greater than those which have been hitherto exploited. Regularity of structure would be a poor compensation to the miner for the fact that the enclosing rock is much harder, and the thickness of ore smaller, than in the ground nearer the daylight.

"The veins vary in width from a knife-blade to 80 centimetres (31.5 inches); their usual thickness lies between 3 and 30 centimetres (0.1 to 1 foot). . . . . .

"Examination of the old workings proves clearly that with increasing distance from the surface the country gets harder, the veinstuff loses its soft character, the veins become fewer in number, more regular, less wide and less ore-bearing. Approaching the surface, on the contrary, the schists are fractured in a multiplicity of directions, the veins become larger, their filling is generally earthy and they throw off branches, at the intersections of which ore bodies are found. In general, mineralization becomes more pronounced with approach to daylight; this being due, not merely to the oxidation of the sulphides but to an actual relative increase of 'orey' matter. . . . . .

"The observations made from day to day led me to conclude that the richest part of the mine was that which was within the influence of oxidation, and that both chemical agencies and structural conditions favored an enrichment of ore near the surface. This statement is particularly applicable to the silver contents. It also holds true of the gold, but it is less accurate with respect to the nickel and cobalt. The richness in silver of the oxidized ores suggests secondary precipitation. This is confirmed by the fact that the silver appears to be thrown down upon the nickel and cobalt arsenides, and often envelops them in such a way as to impart to them the rudiments of a nodular structure. The hard, undecomposed arsenides contain only small amounts of silver. The gold, only occasionally present, is associated invariably with soft, maroon-colored, earthy, iron-bearing vein stuff. The nickel and cobalt minerals appear to be primary ones, and are more persistent than those of silver and gold. . . . . .

"If we accept the current theory that the nickel and cobalt came from the leaching of magnesian silicates (and facts are numerous pointing that way), then, we must con-

clude that the origin of the nickel and cobalt of the Chalanches was not the immediately enclosing country, but rocks similar to it, which underlie it at a greater depth. The silver and gold, it may be suggested, were precipitated from other solutions, and at a period other than that which saw the deposition of the nickel and cobalt. The precious metals were probably derived from a deeper-seated source; and may have been leached from the granite which underlies the schists and is penetrated by the basic eruptives. In both cases the various metals must have come from a depth where leaching action was powerful, and from which ascending currents brought the metallic constituents, the subsequent precipitation of which produced valuable ore-deposits."

Norway

"The cobaltiferous fahlbands of the districts lying around Skutterud and Snarum occur in crystalline rocks varying in character between gneiss and mica schist, but from the presence of hornblende they sometimes pass into hornblende schists. These schists of which the strike is north and south and which have an almost perpendicular dip, contain fahlbands very similar in character to those of Kongsberg. They differ from those of that locality, however, inasmuch as while here the fahlbands are often sufficiently impregnated with ore to pay for working, those of Kongsberg, although to some extent containing disseminated sulphides, are only of importance as zones of enrichment for ores occurring in veins. The ore zones usually follow the strike and dip of the surrounding rocks and vary in breadth from $2\frac{1}{2}$ to 6 fathoms. The distribution of the ores is by no means equal, since richer and poorer layers have received special names and are easily recognized. The predominant rock of the fahlbands is a quartzose granular mica-schist or gneiss. The ores worked are cobalt-glance, arsenical and ordinary pyrites containing cobalt, skutterudite, magnetic iron pyrites, copper pyrites, molybdenite and galena. It is remarkable that in these mines nickel ores do not accompany the ores of cobalt in any appreciable quantity. The principal fahlband is known to extend for a distance of about six miles, and is bounded on the east by a mass of diorite which protrudes into the fahlband, while extending from the diorite are small dikes or branches traversing it in a zig-zag course. It is also intersected by dikes of coarse-grained granite which contain no ore, but which penetrate the diorite."*

These deposits, which at one time were among the world's chief producers of cobalt, are too low grade to be now worked at a profit.

At Kongsberg are famous silver veins, discovered in 1623. In width, in the character of the gangue, which is essentially calcite, and in the fact that numerous veins or stringers occur in small areas, the veins resemble those of Cobalt. Nickel and cobalt minerals are, however, not characteristic of these Norwegian deposits.

New Caledonia

As the table given below shows, there have been during late years about half a dozen countries supplying the world with cobalt. The output of New Caledonia, at the time Cobalt was discovered was much larger than that of any other country. It produced probably 85 or 90 per cent. of the world's supply.

When the ore from Ontario was put on the market, the prices fell materially in New Caledonia, and cobalt mining has now practically ceased in that country. It seems strange that Ontario should be the only serious competitor which this French penal colony, in the southern Pacific, has in both nickel and cobalt. The rivalry between the two countries in the production of the former metal has attracted attention for a number of years. It is now the more surprising that this Province has destroyed the cobalt industry of the island.

The cobalt deposits of New Caledonia occur under similar conditions to those of nickel and the two metals are frequently associated in economic quantities. The deposits of the two metals in Ontario, on the other hand, occur under conditions dif-

*Phillips: "Ore Deposits."

ferent from those of New Caledonia, and little connection has been proved between the cobalt deposits of Temiskaming and the Sudbury nickel ores ninety miles to the southwest. The Sudbury ore consists of pyrrhotite and copper pyrites. It is associated with basic igneous rocks, the deposits being supposed to be of igneous origin. The cobalt silver deposits, on the other hand, occur in distinct veins and are of aqueous origin.

It may be added, however, that the Cobalt and Sudbury areas appear to belong to the same "petrographical province," the diabase and the cobalt of the former area seem to have been derived from the same magma. This diabase is characterized by the presence of free silica, quartz, as is also the coarser grained igneous rock, norite, associated with the Sudbury nickel deposits. A comparison of the ore deposits of the two areas is given in Chapter I.

New Caledonia is a non-glaciated country. Over a considerable part of its surface the immediately underlying solid rock belongs to the basic igneous group known as peridotite. This rock, like other basic varieties, weathers readily, and over a large part of the surface of New Caledonia it is represented by its alteration product, serpentine. The surface of this serpentine is more or less broken down, forming comparatively loose or slightly coherent deposits. It is in association with these that the cobalt is found, its ore being what is known as asbolite, earthy cobalt or cobaltiferous wad. Asbolite is a mixture of oxides of cobalt, manganese and other metals. It can hardly be called a distinct mineral. It has been proved that the cobalt, nickel and other metals found in this decomposed rock were originally constituents of the peridotite.

The peridotites are believed by some writers to be post-Cretaceous in age, and are said to be in the form of a surface flow covering the uneven or eroded surface of the underlying Cretaceous strata.

They constitute the great serpentine formation of New Caledonia, and are high in magnesia and low in iron. They are more or less charged when fresh with crystals of pyroxene, uniquely ferro-magnesian, which lies between enstatite and bronzite. The unaltered rock belongs, therefore, in Rosenbusch's classification, to harzburgite. Dunite, which is composed of olivine with chrome iron ore and without pyroxene, is met with at times. These peridotites usually show traces of advanced alteration which results in the more or less complete transformation of olivene to serpentine, and in the development of talc from pyroxene. At times the alteration is complete enough to produce perfect serpentines, uniquely constituted of an aggregate of crystals of antigorite with some films of talc.

Since these rocks always contain a little manganese, nickel and cobalt, it would appear that these metals are integral of the olivene as well as of the enstatite. Grains of chrome ore are abundant in all samples.

The rocks are often traversed by dikes, less basic, of the character of gabbro, that is to say, rocks which contain feldspar and pyroxene. Diorites fine in grain or at times holding large crystals of hornblende sometimes outcrop in the middle of serpentine exposures.

Much of the mineral mined appears to contain only two or three per cent. of oxide of cobalt. After washing, it averages probably 4½ per cent. In one deposit described by Glasser, it is said that the decomposed material occupies a profound depression in the serpentine. This basin is filled by a red, clay-like deposit which has a depth of about 52 metres in the centre and 10 or 12 metres around the border. The richest ores appear to occur near the centre of the basin and near the contact of the serpentine.

It will be seen that all the cobalt deposits are irregular in form, and hence it is difficult to estimate their value.

The cobalt ore was all exported in the unrefined state.

The metal came on the market in the form of oxide, CoO, which finds use in small quantities in several industries, the principal being that of pottery, where the blue coloration which it tends to give to the ware is employed to counteract the reddish tinge that traces of iron so often produce. It is also used to color porcelain, enamels and

glass. The properties of metallic cobalt are remarkable. It would be used in alloys and for purposes to which nickel is put if it were as low in price as the latter metal. The different uses of cobalt, which absorb annually about 200 to 250 tons of oxide, guarantee a regular demand for the ore.*

Mr. A. Glasser, from whose "Report in 1904 to the Minister of the Colonies on the Mineral Wealth of New Caledonia" the foregoing is taken, states that New Caledonia has practically a monopoly of the production of cobalt in the whole world. He further says that while the deposits of the mineral are capricious they are at the same time numerous and extended.

This monopoly has now been broken by the discovery of the Ontario deposits.

At the time of Mr. Glasser's visit to the colony, the prices paid for cobalt ore were about as follows:—

Mineral with 4 per cent. CoO	330 Fr. a ton ($66).
Mineral wih 3 to 3½ per cent. paid on the same basis, 145 fr. and with an increase of .60 fr. for each 1-10 of 1 per cent., above	195 Fr. a ton.
From 4 to 5 per cent., for each 1-10 of 1 per cent. above 4 per cent., there was paid	.80 Fr.
From 5 to 6 per cent., for each 1-10 of 1 per cent. in excess of 5, was paid	.90 Fr.
From 6 to 7 per cent. for each 1-10 of 1 per cent. above 6, was paid	1. Fr.
Above 7 per cent., for each 1-10 of 1 per cent., was paid...	1.50 Fr.

On this basis mineral carrying 8 per cent. brings 750 Fr. ($150) a ton.

In 1905, New Caledonia shipped the following number of tons of cobalt ore to the countries named, viz.: England 3,352, France 2,238, Australia 1,792, Germany 537, or a total of 7,919 tons, which is over 1,000 tons less than the shipments of 1904.

The following are the shipments of cobalt and nickel ores for the last three years:

	1905.	1906.	1907.
Cobalt	7,910	2,487	3,942
Nickel	125,289	130,688	101,707

The prices paid for cobalt ore in New Caledonia during the first quarter of 1908 were about as follows:—For 4½ per cent. $23 (115 fr.) a ton; for 5 per cent. ore $27 to $28 (135 to 140 fr.), and 90 cts. (4.50 fr.) for each one-tenth of one per cent. above. At these prices, it is said, only the richest, well situated and developed mines can be worked. Many of the smaller mines have been obliged to close. An 8 per cent. New Caledonia ore at the price quoted would bring $36 a metric ton.

The Anglo-French Nickel Company of Swansea, Wales, who have been buying ore at Cobalt for the cobalt contents alone, pay 30 cents a pound for the metallic cobalt in an 8 per cent. ore. This is about $53 per ton for such ore. It is to be concluded, therefore, that the Canadian ores are preferred to those of New Caledonia by the refiners.

*It may be added that the method of manufacturing blue cobalt glass has been known almost from pre-historic times, as the glass has been found in the graves of the ancient Egyptians and in the ruins of Troy.

Production of Cobalt 1896 to 1900

Country	1896		1897		1898		1899		1900	
	Tons	Value	Tons	Value	Nons	Value	Tons	Value	Tons	Value
		francs		francs		francs		francs		francs
New Caledonia..	4,823	482,300	4,757	475,700	2,373	237,300	3,294	336,000	2,438	275,500
New South Wales	.....	.....	.....	.....	119	14,000	193	22,975	145	39,750
Chili	.....	.....	6	780	18	4,540	55	20,450	27	10,060
Spain	18	9,000	15	17,000	.....	.....	.....	.....	.....	.....
Norway	19	13,500	24	13,500	21	10,800	.....	.....	.....	.....
Prussia	181	49,340	121	31,280	34	8,500	17	4,250	4	800
Total	5,051	554,140	4,921	538,266	2,565	275,140	3,559	383,675	2,614	326,110

1 franc = 20 cents.

This total was augmented by some tons of complex mineral mined in different parts of Germany and Austria, from which a little cobalt was produced.

Taking the world's consumption of cobalt oxide, CoO, at 200 to 250 tons a year, as given above, the 2,614 tons of ore produced in 1900 would need to contain on the average over 8 per cent. of the oxide. The price of the ore averaged, as shown by the table, approximately 125 Fr. or $25 a ton. It may be added that cobalt oxide, CoO, contains 78.66 per cent. of cobalt and 21.34 per cent. of oxygen by weight. The Temiskaming ore is sold on the basis of metallic cobalt, not on that of the oxide as in New Caledonia. But nothing is paid for much of the cobalt in the silver ores sold at Cobalt.

New South Wales

The second largest producer of cobalt in the world, before the discovery of the Temiskaming deposits, was New South Wales. The deposits in this country are situated near Port Macquarie and are similar in character to those of New Caledonia.

In 1903 the quantity of cobalt ore exported from the deposits near Port Macquarie amounted to 153 tons, valued at £1,570.

South Australia

Cobalt ore, containing smaltite and other minerals, is found at Bimbowrie, near Olary, on the Broken Hill line, but little work has been done on the deposit.

South Africa

While silver has, as we have seen, been worked in association with cobalt, the latter metal has been very seldom found in association with gold in important quantities. Reference to only one such occurrence has been seen by the writer. This is in the Middleburg district in the northern Transvaal. Here in this non-glaciated district the gangue material, in the vein to which reference has been made, is kaolin, with which is mixed gold-bearing quartz. In the latter mineral are small nest-like aggregations of smaltite and copper ores, and at times molybdenite and the secondary minerals cobalt bloom, limonite and skoradite.

In a publication a few years ago, a brief account of one of the cobalt deposits is given in the following words:* "Cobalt, in the form of smaltite and erythrite, is found at Balmoral, and also just beyond the northern boundary of the map in the valley of the Kruis river. At Balmoral the cobalt is associated with felspar and actinolite, together with secondary quartz and calcite, in veins most probably of igneous origin, which traverse a series of highly altered sedimentary rocks of shaly character in the neighborhood of the junction of the Waterberg and Transvaal systems."

*"Geology of the Neighborhood of Middleburg," Transvaal Mines Dept., Pretoria, 1907.

It will be seen that these South African cobalt veins resemble those of the Montreal river area, Ontario, described on a preceding page, in that they contain felspar and appear to be of igneous origin.

United States

Up to the present time there has been more or less production of cobalt oxide in the United States. Some of this came from the cobalt associated with the nickel ores at Sudbury, Ontario. In the process of smelting, which is now used at Sudbury, the cobalt is slagged out of the matte. Hence none of this metal will be produced in the future from Sudbury matte in the United States. According to the "Mineral Industry," in 1902 there was no production of cobalt oxide from domestic ores in the United States. In 1901, 13,360 lbs. of cobalt were derived from slag produced in the smelting of the lead ores at Mine La Motte, Missouri. In 1903 cobalt and nickel are said to have been discovered near Marion, Kentucky, in association with the fluorspar in that region. In the same year the Mine La Motte Company undertook the construction of a smelter and refinery for treating the nickel and cobalt ores obtained in connection with lead mining. A refinery was afterwards operated at Fredericktown, Mo., but is now closed.

It is said that a few years ago one or two small trial shipments of cobalt ore from deposits in Grant county, Oregon, were made to France. The deposits in this county are described as occupying fissures in a dark-greenish, more or less altered diabase-porphyry. They have a general northeasterly and southwesterly strike, and dip southeast. The ore bodies appear to be more or less lenticular in shape and vary from a few inches to several feet in width. The principal minerals are chalcopyrite, smaltite, arsenopyrite, pyrite, pyrrhotite, malachite and bornite with a quartz and calcite gangue. The values are chiefly in gold, cobalt and copper. Smaltite from a sample of the ore carrying this mineral and chalcopyrite was found by Mr. Burrows to have the following composition (No. 1). This smaltite had a rather unusual appearance, resembling somewhat acicular or fine columnar stibnite. In composition it is close to that from Gunnison county, Colorado, an analysis of which is given by Dana (No. 2).

	No. 1.	No. 2.
Cobalt	14.88	11.59.
Nickel	1.12	trace.
Arsenic	64.06	63.82.
Sulphur	.57	1.55.
Iron	11.14	15.99.
Insoluble	2.22	etc.
Calcium carbonate	6.34	
Total	100.33	

Mexico

Cobalt-holding minerals have been found at several localities in Mexico. Little has, however, been published concerning these occurrences. Near the village of Pihuamo, state of Jalisco, cobalt minerals are found in veinlets cutting a large vein of magnetite associated with pyrite and pyrrhotite. The chief rock in the vicinity is described as andesite. It is said that some tons of ore have been mined which contained 8 or 9 per cent. of cobalt. The minerals are cobaltite together with small quantities of smaltite and cobalt bloom. The veinstones are calcite, slightly greenish, and a little barite. A little niccolite appears to be present.

The following Mexican localities are also said to contain cobalt minerals: Iturbide, in Chihuahua, Guanacevi in Duranago, Cosala in Linaloa, at the mine "Mirador" in Jalisco. It is said that the zinc in smithsonite is partly replaced by cobalt in Baleo, Lower California.

Chili

From the table on a preceding page it will be seen that Chili has been a producer of cobalt. References to the occurrence of the metal in that country are few, and the writer is not able to say what the ores are. According to Dana smaltite occurs, but in small quantities, at the silver mines of Tres Puntas and elsewhere in Chili.

4. METALLURGY

The characteristics of the metal cobalt and its compounds are much like those of nickel and its compounds. The methods used for extracting one metal from its ores are similar to those used in the case of the other. Since these methods are complicated, an attempt will not be made to describe them. The reader, desirous of a knowledge of the methods, is referred to some standard work on metallurgy, such as that of Schnabel.

In former times cobalt glass, "blue color," was made directly from some of the purer ores carrying cobalt, nickel, silver and arsenic. Most of the arsenic was first roasted off, and to the residue were added the constituents of potash glass—powdered quartz and carbonate or other compound of potash. The roasted ore, with these constituents added, was then melted down, the cobalt uniting with the glass to form smalt and the nickel and silver settling to the bottom of the furnace. If a little arsenic was not left in the ore some of the nickel would also combine with the glass, thus injuring its color.

The blue glass, or smalt as it is called, was powdered and sieved, and was then ready for the market. An interesting account of this method of manufacturing smalt is given in Knapp's "Chemical Technology," first American edition, Vol. II, 1848.

Cobalt now comes on the market in the oxide form, CoO. There are seven or eight manufacturers of this oxide in Europe—three in England and two or three each in France and Germany. The producers in Ontario are the Coniagas Reduction Company at St. Catharines, the Deloro Mining and Reduction Company at Deloro, and one or two smaller plants. Little cobalt is used in the metallic form, owing to the fact that nickel serves practically the same purposes as metallic cobalt and is much lower in price. It is said that a little cobalt added to nickel in plating tends to produce a more silvery and less steel-like lustre. By far the largest consumers of cobalt are the potteries.

APPENDIX I.

THE PALEOZOIC ROCKS OF LAKE TEMISKAMING

The limestones with, in places, basal sandstone and conglomerate that are found on the shores and certain of the islands of the northern part of lake Temiskaming, are much younger than the cobalt-silver deposits, and thus are of little interest in this report.

The character of the limestones and the uses to which they are adapted are described briefly on a preceding page. The fact that one, at least, of the great faults of the region has dislocated the limestones has also been mentioned.

In his report on the "Geology and Natural Resources of the area included by the Nipissing and Temiskaming Map-Sheets," Dr. A. E. Barlow has given a good description of these Paleozoic rocks of lake Temiskaming.* Since this description will be of interest to students and others visiting the lake it is reprinted in following paragraphs.

SILURIAN

Clinton and Niagara.

"The rocks of this age exposed on the shores and islands of the northern portion of lake Temiskaming have been of exceptional interest to geologists ever since their discovery and description by Logan in 1845.† Geographically, this outlying patch is so widely separated from any locality where rocks of similar age are now known to exist, that it has been a question whether it is indicative of an area of marine submergence connected with that in which the fossiliferous strata of Hudson Bay were deposited, or whether it was in some way connected with the Niagara basin to the southwest. It has been previously asserted that these rocks belong rather to the great northern trough connected with Hudson Bay, of which they are probably an outlier, and the absence of all strata of Niagara age in the region bordering the lower Ottawa has served to strengthen this belief. Although in lithological character and colour the rocks of similar age exposed on Temiskaming exhibit a marked similarity to the Niagara exposed further to the north, the rich and varied fauna characteristic of this outlier presents no corresponding resemblance, but rather a close analogy with the Niagara formation of southwestern Ontario.

"It has been shown that a pronounced similarity exists both in lithological character and fossil remains between the Niagara of the Winnipeg basin and that exposed in the vicinity of the Churchill on Hudson Bay, although these areas are now widely separated, while both present organic forms that are entirely lacking in the Temiskaming outlier. These facts, therefore, seem to prove that the seas in which the Niagara sediments of the Winnipeg basin and of Hudson Bay were deposited were practically continuous, while both were separated from the Temiskaming basin and the region to the southwest. The strata forming the Temiskaming outlier occur in the form of a shallow synclinal trough, occupying somewhat more than the breadth of the lake, which is here about six miles, and extending from the northern end of Moose or Bryson island northwestward beyond the confines of the present map. On both sides of the lake the rocks incline towards the water at varying angles, depending on the character of the shore-line; although in general the dip does not exceed 10°, and angles of lesser amount are far more common. On Mann or Burnt island, as well as on the peninsula to the north, the limestones show a very gentle westerly inclination of between one and two degrees, while on Percy or Farr island, near the west shore, the rocks are very nearly, if not quite, horizontal. It is thus evident that any section made must of necessity be more or less ideal, and any thickness based on the observed angles of the dip is sure to be

* "Geological Survey of Canada," Vol. X, 1897, Part I. The colored geological map, scale 1 mile to 1 inch, that accompanies this volume, shows the localities mentioned in the text.

† "Report of Progress," Geol. Survey of Canada, 1845-46, pp. 69-70. "Geology of Canada" (1863), pp. 334-336.

misleading. The whole thickness exposed in any one section is somewhat less than 150 feet, and it seems certain that the total amount of the Niagara exposed on this lake cannot be greater than 300 feet, and may be considerably less. The occurrence of loose angular fragments and slabs of grayish dolomite, resembling that exposed in the vicinity of lake Huron and Nipissing and containing characteristic Trenton fossils, has been noticed.* These are distributed at several points on the shores of the lake and specimens were collected from the northeast shore of Chiefs' island. Although their source has not yet been ascertained, the angular character of the fragments and their abundance shows clearly that this cannot be far distant. The lake is here over 200 feet in depth, and it is just possible that below the Niagara limestone and concealed beneath the waters of the lake there exists an area of Cambro-Silurian rocks. This, however, can only be ascertained by boring, as no exposures of these rocks were encountered, although a diligent search was made with this object in view.

"The relatively smaller quantity of conglomerates and sandstones, characteristic shallow water deposits, and the rapid alteration from these coarser clastics to the fine-grained limestones indicative of deep water deposition, point to a rather sudden marine invasion; while the comparatively great volume of strata remaining shows a prolonged submergence. The fine-grained character of most of the limestones show that their deposition took place in a quiet arm or extension of the sea, not affected by the open ocean, while the abundance and character of the fossil remains are ample testimony of the genial character of its waters.

Wabis Bay

"As exposed on the west side of Wabis bay, in the northwest corner of the lake, the lower portion of this formation is composed of a loosely coherent sandstone or grit alternating with thinner beds of a fine conglomerate, with pebbles chiefly of Huronian quartzite, most of which have a thin coating of yellowish or brownish iron oxide, while the matrix consisting of similar material in a finer state of division, contains a slight admixture of calcareous matter. The actual contact between this and the underlying slate of the Huronian is not seen, although only a few yards intervene between the exposures of the two rocks. The existing relations can, however, be made out pretty clearly, for while the compact and rather massive slaty rock which here represents the Huronian occurs in exposures with more or less rounded or hummocky outlines, the arenaceous strata of the Niagara dip off or away from these hillocks at an angle of 5°.

Haileybury

"At Haileybury, on the western shore of the lake, close to the water's edge and cropping out from the shingle is a small exposure of light-yellow, fine-grained limestone, without visible fossil remains, dipping northeast 25°. The discovery of limestone with the general contour of the country in its vicinity, seems to suggest that a small patch of Niagara extends northerly along this shore towards Wabis bay, being perhaps three miles in length by about a quarter of a mile in breadth, underlying the clay which here effectually conceals any rocks which may be beneath.

Percy or Farr Island

"Farther south, on Percy island, which is only a few chains in length and is separated from the western mainland by a very shallow and narrow channel, the rock exposed is a light-yellowish limestone, presenting a very uneven or cavernous surface as a result of unequal weathering. The strata are nearly, if not quite, horizontal, and weather from yellow to brown or almost black, as a result of the iron present. Shells of various species of brachiopods are somewhat numerous.

"A number of the fossil remains collected have been determined by Dr. Ami as follows:—

*"Geology of Canada" (1863), p. 335.

Clathrodictyon fastiguatum, Nicholson.
Favosites Gothlandica, Lamarck.
Syringopora Verticillata, Goldfuss.
Crinoidal fragments.
Leptæna rhomboidalis, Wilckens.
Atrypa reticularis, Linæus.
Meristella, sp.
Anoplotheca hemispherica, Sowerby.
Pterinea, sp.
Also branches of obscure Monticuliporidæ.

"This fauna represents the Clinton or base of the Niagara or lower part of the Silurian.

Chiefs' Island

"The northern and western points of Chiefs' Island rise into comparatively high ridges of massive quartzose sandstone or quartzite-grit, which present the usual rounded and glaciated outlines. Sheltered in the bay intervening between these two points is a small patch of boulder conglomerate, composed of sub-angular masses derived from the underlying quartzite. These are imbedded in a calcareo-arenaceous matrix composed chiefly of pebbles and finer material, the whole representing evidently a boulder-strewn beach covered by later sediments of the Niagara formation. The surface of the quartzite on which this conglomerate rests presents the hummocky character so common in the case of the hard Archæan strata, the irregular cracks and depressions being filled by the conglomerate. Subsequent glaciation has removed much of the material, so that the exposure now presents a plane surface with a more or less net-like structure, the framework being represented by the finer arenaceous cement, while the meshes or interstices are occupied by truncated sections of quartzite boulders as well as of the rounded hillocks of the solid rock beneath. Some of the boulders present in this conglomerate were evidently large concretions, as they exhibit concentric structure and weather very rusty owing to the disintegration of the large proportion of iron present. The finer cementing material, while relatively much smaller in amount than the pebbles and boulders, is always of a greenish or yellowish colour, and frequently contains corals and orthoceratites. The action of the weather partially obliterated the glacial striæ on this finer matrix, but the sections of the quartzite boulders and hummocks exhibit these markings in great perfection.

"On the southwestern shore of Chiefs' island is another small patch of a finer grained conglomerate, the pebbles of quartzite being less numerous and of much smaller size, while the matrix contains much more calcareous matter. The rock dips southeast 5°.

"A number of rather badly preserved fossils were secured at this locality which have been named as follows by Dr. Ami:—

Halysites catenularia, Linnæus.
Columnaria, sp, with very irregularly disposed horizontal tabulæ.
Zaphrentis, sp.
Streptelasma or *Caninia*, sp.
Rhynchonella, sp.
Murchisonia, two species.
Euomphalus, very large species.
Discosorus, Cf. *D. concideous*, Hall.

"The above fauna represents the Clinton formation or lower portion of the Niagara.

Piche Point

"On the east side of the lake, from the point south of Chiefs' Island to within less than a quarter of a mile from Piché Point, the shore is occupied by a narrow fringe of the basal conglomerates and sandstones of the Niagara. The coarser beds are of the

boulder conglomerates already described, representing simply a talus of angular and sub-angular fragments detached from the elevations in the immediate vicinity of the exposures, consolidated together by a finer grained arenaceous cement of a yellowish colour, in which are also imbedded fragments of corals and orthoceratites.

"This boulder conglomerate passes upward into a fine conglomerate, in turn replaced by a coarse grit, and becoming finally a yellowish, rather friable sandstone. These beds run in long undulating curves, closely following the general outline of the underlying quartzite with a general westerly dip at angles varying from 10° to 15°. The action of the waves has in places caused this to disintegrate very unevenly, leaving a roughly pitted surface. At Piché Point and for some distance north, the Huronian quartzite is left entirely denuded of these deposits.

"In the bay to the south of Piché Point, and between this and Wright's silver mine, there are two small patches of thinly bedded light-yellow arenaceous limestone dipping in a southerly or southwesterly direction 5°; immediately south of Wright's mine is another small patch of similar arenaceous limestone dipping southwest 9°.

"On the east shore of the lake, nearly opposite Bryson island, there are two more small patches of the arenaceous limestone exposed at the shore wrapping round the hummocks of Huronian quartzite and dipping in a southerly or southwesterly direction 5°. None of these small patches of limestone contained any visible fossil remains.

Mann Island and Dawson Point

"On Burnt or Mann island, as also on the two smaller islands between this and Bryson island (Oster and Brisseau islands), as well as on the high promontory (Dawson point) separating Wabis and Sutton bays in the northern part of the lake, are exposed the limestones and shales that represent the deep-water deposits of this period. The limestone is of a pale yellow or cream colour, weathering whitish, and varies in thickness from a few inches up to two feet or over. Some of the beds are very fine-grained and of rather even texture, and it is possible that some parts may prove to be sufficiently uniform for use as lithographic stone. As a building stone it is of excellent quality. These limestones, on the north shore of the lake at Dawson point dip a little south of west at an angle of between one and two degrees, rising into cliffs of over a hundred feet in height on the west side of Sutton bay, and forming a somewhat elevated rocky plateau with a gentle westerly slope, corresponding mainly with the angle of dip towards Wabis bay. The east shore of Mann island presents a somewhat similar, though much lower escarpment, while the western shore is a gently shelving beach, which at low water reveals considerable areas of the almost horizontal limestones. Some of the beds contain a considerable proportion of silica of a cherty character, and all the fossils are more or less silicified. The action of the weather causes them to stand out in relief and often displays their minute structures perfectly. A large collection of these fossils was made along the western shore of Mann island, comprising the following forms as determined by Dr. Ami and Mr. L. M. Lambe:——

Bythotrephis (Chrondrites) gracilis, Hall.
Bythotrephis. Cf. *B, palmata*, Hall.
Clathrodictum fastigiatum, Nicholson.
Cyathophyllum articulatum, Wahlenberg.
Zaphrentis Stokesi, Milne-Edwards and Haime.
Favosites Gothlandica, Lamarck.
Alveolites Niagarensis, Rominger (non Nicholson).
Cladopora crassa, Rominger.
Syringopora verticillata, Goldfuss.
Syringopora Bifurcata, Lonsdale.
Halysites catenularia, Linnæus.
Halysites compacta, Rominger.
Lyellia affinis, Billings.
Lyellia Americana, Milne-Edwards and Haime.

Thysanocrinus liliiformis, Hall.
Dendrocrinus longidactylus, Hall.
Taxocrinus, n. sp.
Lichenalia concentrica, Hall.
Phænopora expansa. Hall.
Trematopora, sp.
Orthis (Dalmanella) elegantula, Dalman.
Orthis calligramma, Dalman.
Platystrophia biforata, var. *lynx*, Eichwald.
Strophomenoid shell, type of *Rafinesquina*.
Stropheodonta, sp. (? n. sp.)
Leptæna rhomboidalis, Wahlenberg.
Atrypa reticularis, Linnæus.
Atrypa intermedia, Hall.
Trematospira, sp.
Pentamerus oblongus, Sowerby.
Euomphalus alatus, Hisinger.
Murchisonia, sp.
Murchisonia, subulata, Hall.
Discosorus conoideus, Hall.
Discosorus gracilis, ? Foord.
Orthoceras, sp.
Orthoceras, sp. Cf. *O. virgulatum*, Hall.
Orthoceras, Cf. *O. Cadmus*, Billings. Cf. *sub-cancellatum*, Hall.
Actinoceras vertebratum, Hall. *A. Bachi*, Stokes.
Calymene Niagarensis, Hall. Probably identical with *Calymene*.
Blumenbachii, Brongniart.
Beyrichia, sp. Cf, *B. lata*, Hall."

APPENDIX II.

PROFILE

FROM

Toronto to the Archean Paleozoic boundary on Hudson Bay Slope.

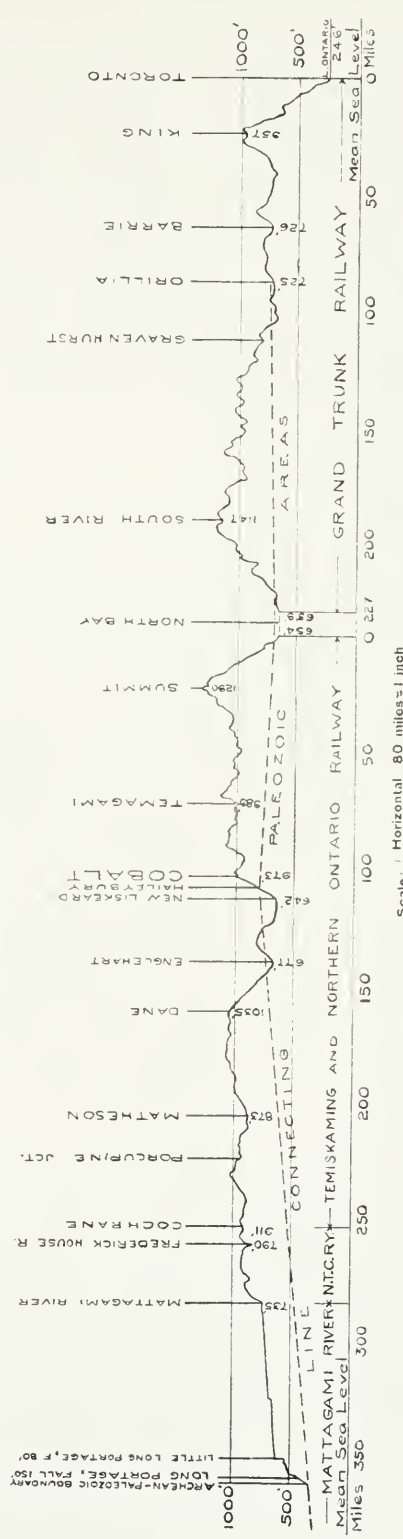
TO ACCOMPANY

Part II. of the Nineteenth Report of the Bureau of Mines, Ontario.

WILLET G. MILLER, Provincial Geologist 1911 W. R. ROGERS, Topographer.

Sources of Information: "Attitudes in Canada" by Jas. White
Profiles of the Grand Trunk, Temiskaming and Northern Ontario, and National Transcontinental Railways.
The section showing the Mattagami River is approximate, having been compiled from various sources, and some of the data is conflicting.

Notes: The profile connects four Paleozoic areas. The northern edge of the Lake Ontario area is in the vicinity of Orillia. Smaller areas or outliers are found at Lake Nipissing and at Lake Temiskaming. The north end of the profile shows the location of the southern edge of the James Bay area. With the exception of the outliers at Lakes Nipissing and Temiskaming the profile crosses pre-Cambrian areas. The profile is instructive in that it brings out the plain-like character of the pre-Cambrian region.



APPENDIX III.

THE EARLY HISTORY OF THE COBALT INDUSTRY IN SAXONY

Translated by G. R. Mickle

"Is there anything whereof it may be said, See, this is new? it hath been already of old time which was before us."—Ecclesiastes.

Introduction

The following translation of portions of W. Bruchmuller's work (now unfortunately out of print) on the early history of cobalt mining and the manufacture of blue color in Saxony will perhaps interest those engaged in the cobalt industry to-day*. In the main the problems ahead of the miners of that metal at the present time are the same as they were over three hundred years ago.

The cobalt production marked a second period of mining activity in the district in question. The first was characterized by a feverish excitement and activity and a comparatively short life. Silver was the only metal sought at first and the veins were sometimes fabulously rich. Two systems of veins were known—the silver with barite as gangue mineral and the cobalt veins with quartz.

The exact time when mining started in the cobalt region is not known, but the first important discovery of silver ore was made at Schneeberg in 1470, and the growth of the industry was phenomenal; by 1474 there were 176 producing mines. The most famous was the St. George at Schneeberg where veins of different formations joined and where one enormous block weighing 20 tons, described as 6 feet wide and 12 feet high, consisting of native silver, argentite, ruby silver and the chloride of silver was found. Records mention a banquet given underground by the Duke of Saxony using this block or nugget as a table.

Silver mining flourished for 25 years or more and then began to die down. Some of the veins had a length of about 2,500 feet and were followed in depth about 1,000 feet. These were, however, extreme limits.

In the case of the essentially cobalt veins (which carried some silver) there was an extraordinary massing or crowding together. In an area of less than four square miles 150 productive veins were found. After the invention of cobalt blue, mining flourished again.‡ It is with this second period of activity that Bruchmueller's work is concerned.

It is evident from the translation given below that an immense amount of searching into old archives was involved in the preparation of this work.

FORMER PRODUCTION OF COBALT GREATER THAN AT PRESENT

One thing that is striking in reading the accounts of the cobalt industry of one or two hundred years ago is that at that time the amount of cobalt produced was probably greater than it is now. A work by Friedrich Kapff, published in 1792, gives details of the state of the industry at that time. Kapff was employed by the Finance Minister of Prussia to make a report on the works in Querbach in Silesia particularly, and he included also a description of all theother works existing at that time, which he had visited. These amounted in number to twenty-three, not including the works of Holland. One French works is included and also one in Norway. Unfortunately the amount of cobalt oxide is not given, but the amount of smalt or blue color, the manufacture of which is described below, is mentioned. In sixteen out of twenty-three cases such information is given that the amount can be fairly closely estimated, and it comes to about

*Der Kobaltbergbau und die Blaufarbenwerke in Sachsen bis Zum Jahre 1653 von W. Bruchmueller, 1897.

†Stelzner-Bergeat. Erzlagerstaetten.

in pre-historic times.

‡This was really a re-invention, as cobalt is said to have been used for staining glass

2,500 tons, so that if the other seven works were included it would probably amount to over 3,000 tons. Of this amount about one-half was produced in the Saxon works which were much the most important. The works were of course small when compared with smelting works as they exist now. For instance, in the description of one of the best of the smelting works the external dimensions were 48 feet × 34 feet and 44 feet high, and this building included a room for the foreman. The mechanical building, where the stamp batteries were for pulverizing, was 114 feet, 30 feet wide, and contained eight stamps, a grinding mill, storeroom and drying rooms for drying the quartz. The works were built always on some stream which furnished the water power and were worked by over-shot wheels.

With regard to the smelters in Holland no details are given of amounts. It is known, however, that the Dutch refineries supplied the Irish trade almost entirely, and also consumed a large amount themselves in the linen industry and in the manufacture of litmus.

In all the trade, including the amount made in Holland, the total manufacture of color would probably be from four to five thousand tons, and this color might contain anything from three to, say, fifteen per cent. of cobalt, therefore probably three to four hundred tons of cobalt were actually manufactured in Europe over one hundred years ago, so that in spite of the enormous increase in the consumption of all the other metals, owing to the expansion of industries, the consumption of cobalt has probably actually decreased. This is due no doubt to the fact that it has been replaced in the linen trade by vegetable coloring matter.

BEGINNING OF COBALT INDUSTRY

The beginning of cobalt mining and the knowledge of the use of cobalt in Saxony are wrapped in obscurity. The discoverer of the blue color is said to have been a Frenchman, Peter Weidenhammer, who settled in Schneeberg in 1520 and made a blue color which he sold in Venice for 25 thalers* a hundredweight (112 lbs.). Christian Schuerer is said to have improved the invention of blue color. He had a glass works at Neudeck, and it is believed that there for the first time a blue color was made out of the cobalt from Schneeberg by fusing and the addition of pearl ash or potassium carbonate. It is said that this color was sent to Nueremberg and was there seen by the Dutch, who then went themselves to Neudeck and persuaded Schuerer to go with them to Madgeburg to make cobalt blue for them. Afterwards, when they had learnt Schuerer's secret, they sent him home again, where he started a small color mill. A hundredweight of this color at that time cost 7½ thalers. It sold in Holland for 50 or 60 gulden.† The Dutch are said to have immediately built eight color works and to have imported the necessary cobalt from Schneeberg. This blue color was made by taking the cobalt ore, in this case, smaltite, which contained some bismuth, and melting the bismuth out by gentle heating; then it was stamped and roasted in reverbatory furnaces. It was important that the roasting or oxidation should be as complete as possible. The result of this process was the cobalt oxide, known in the trade as safflor, a grayish brown powder. In order to make cobalt blue out of the oxide it is mixed with potassium carbonate (pearl ash) and white quartz and fused, then dipped out with iron spoons into a large vat, in which cold water runs continuously. By this means the blue colored glass attained its deep blue tint and became so brittle that it could be crushed and ground.‡ This crushed and ground material is then sifted, washed and finally graded through very fine sieves. By means of the washing the soluble constituents are removed, and the different colors known to the trade are produced, according to the fineness of the material.

We see, therefore, that in the beginning the production of the cobalt oxide in Schneeberg was not in the hands of large operators, but the small works treated their own cobalt and sold it to dealers who came to Schneeberg. The oxide was then sent to foreign countries.

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* Thaler=about 75 cents.
†Gulden=about 45 cents.
‡The blue color or smalt usually contains about 6 per cent. cobalt.

Cobalt Works in 1568

In the knowledge of the art of color-making they seem to have made rather rapid progress, for about the end of the sixteenth century they had begun to make the blue color themselves. The first one to make this was Christopher Stahl, who put up a small smelting works at Schneeberg in 1568, also some mills, melting furnaces and color works, in which he made a blue color for artists. Nothing is known about the extent of his works, but it could not have been great, as Stahl's undertaking is only mentioned incidentally, and the production of colors for artists could naturally not be carried out on a large scale. These works did not last long. They were swept away by flood in 1573. After Stahl's death an attempt was made to carry on the color trade on a larger scale, and according to the spirit of the times, this undertaking must first be protected against competition by a decree on the part of the State, but in spite of the energy and business ability and large capital of the two engaged in the undertaking, it failed. The two in question were Hans Harrer and Hans Jenitz. They went to the Prince in 1575 requesting a concession to erect a color works and to allow them the exclusive right for ten years to purchase cobalt ore in Schneeberg. They stated that they had noticed for fourteen years how the oxide which was prepared in Schneeberg and the vicinity was bought up by agents of foreign merchants and sent out of the country to Nuremberg and from there to Italy and Venice and other places. Out of this oxide blue color was made and sold at a high price. By means of laborious experiments and at a large expense they had arrived at the secret of the preparation of the blue color, and they were now willing to put up a works but they were afraid that very soon others would be engaged in the preparation of colors, and therefore they requested the concession mentioned above. Stahl's works were not mentioned by them at all, and from this we see that his plant cannot have been large.

First Monopoly Granted in 1575

This concession was granted them by Prince August in 1575. According to it Harrer and Jenitz could erect the color works and they alone had the privilege for the next ten years to buy cobalt oxide in Schneeberg, and they could work it up and deal with it as they wished. They had to pay, however, the cobalt mines the same price which they had got for the ores from the foreign dealers. No one during these ten years could engage in the preparation of color without their consent, neither could he buy the ore or the oxide and ship it out of the country.

This undertaking, however, did not fulfil the expectations placed upon it. Schneeberg was, of course, the principal place of production for the oxide, which, as before, was chiefly prepared by the works themselves, and then sold to Harrer and Jenitz. The color exchange was in Dresden, but in spite of numerous efforts, the disposal of the colors presented great difficulties. Moreover, contrary to the royal concession many engaged in the preparation of color in Schneeberg, and bought up the oxide and sold to competitors in Nuremberg, who probably also worked up Bohemian cobalt and brought it on the market. A letter of this period, namely, 1579, from Hans Harrer to foreign merchants shows us the state of affairs and how Harrer exerted himself to find a market for his product. Harrer complains that he had spent a great deal of money for the purchase of the oxide and the preparation of the color, but in spite of all that he could not find a market for it. He could only deal in the matter at a loss. Not long before, he stated, he had sent some of his color to Lisbon, but the merchants there had done very little with it and finally it was left unsold. He (Harrer) had quite a stock on hand which he wanted to get rid of, and he therefore asks for the addresses of those to whom he might send it.

Troubles of the Cobalt Buyers

In 1579 Harrer and Jenitz complained to the Prince. They stated that in spite of the concession which had been granted them there were about twenty others in Schneeberg who were engaged in buying up cobalt and making it into color, and that

these others were putting everything into barrels, whether it was good or bad, and trying to sell it for good color, and therefore it had come to this that during the four years of their monopoly they had put several thousand gulden into the undertaking, and had not been able to sell most of the color or oxide which they had prepared. Moreover, several of the inhabitants of Schneeberg, contrary to their concession, had demanded a higher price for their oxide, and when this was not granted they had taken the color out secretly at night and even sometimes had packed it out openly on their backs. Harrer and Jenitz, therefore, begged for a renewal of their monopoly and an extension for four years more, and a sharper decree against the smuggling of cobalt and cobalt oxide.

The Prince granted this request and renewed the concession till 1589, according to it the contractors alone had the right to buy bismuth and cobalt and the oxide. The works might, it is true, work up their cobalt ore themselves to oxide, but then they must sell it to Harrer and Jenitz for 10 groschen* a hundredweight. Selling to others would be punished with a fine of 200 thalers and confiscation of the goods, which would belong to Harrer and Jenitz. In spite of this decree the undertaking was not a success, and after the death of Jenitz in 1589 (Harrer had died in 1580) and the expiry of the concession in the same year, it was not renewed, so that the first attempt to organize the Schneeberg cobalt and color trade and to make the blue color in Saxony themselves, was a failure.

Change in Industrial Conditions

About this time there was a change in the political organization of the country. Every undertaking of any size required a concession from the Prince, just as we saw in the case of mining, and the ideas of the rights of the Princes gradually changed. These conditions made their influence felt on the cobalt mining of Schneeberg, and rendered it possible to bring in considerable amounts of foreign capital because the Princes, who were at this time almost always in need of money, gave concessions for the exploiting of their mining privileges in consideration of certain loans from foreign traders. This was acceptable to the foreign traders, as they had thereby the only security for their money.

Stealing of Ore in 1603

In the year 1603 we hear for the first time of a more strict supervision on the part of the Prince over the production of oxide. In this year the mining office complained to the Prince that there were people in Schneeberg who were engaged in making the oxide, but did not have any cobalt or bismuth mines. The Prince decreed, therefore, that for the future no one should be allowed to buy cobalt or bismuth or sell it before it had been accepted by the mining office and determined whether it came fresh from the mine or had been taken from some dump.

Export Tax

Shortly after this also the Prince put a tax on the Dutch merchants for the cobalt that was bought in Schneeberg, and ordered a strict supervision of the export. In the decree in question it was stated that merchants from Holland in the last quarter of the year had bought over four thousand hundredweight of oxide in order to take it to Holland, England and Spain—from this the Prince did not receive any taxes. Out of the tax of one-twentieth very little came in, and from this the Prince had always to keep the principal adits in order and therefore for every task of oxide that was sold a gulden must be paid as tax. This tax would fall on the foreigner, and they would not evade it because they had a good market for their wares; all colors, for the purpose of collecting this tax, must be weighed by an official in Schneeberg, and recorded. Any evasion of the tax would be punished with a fine of 500 florins, and confiscation

*Groschen=about 2½c.

of the goods. Every cask must be printed with a certain mark, and all casks without this mark were to be expropriated. In the same year one Berckau from Joachimsthal came to the Prince with a proposition that the Prince should take the sale of the color into his own hands, as according to Berckau every year great quantities of color and cobalt were sent from Schneeberg to Hamburg and Holland, and from this the Prince only received a very small tribute, but everything for the manufacture of color was found in Saxony, and he, Berckau would guarantee to make good color glass out of the Schneeberg cobalt for half the price which it cost them in Holland and Hamburg. Moreover he said the Hollanders would far rather buy the glass than the raw oxide. If the Prince would take the sale of the color in his own hands he and an associate would take charge of it and produce yearly two or three thousand hundredweight of color glass. He gave two calculations as to the cost of color in Saxony and Holland as a basis for his proposition. The calculation as to the cost in Saxony was as follows:

	Florins.
100 cwt. of unstamped cobalt ore cost	300
Wood for roasting	9
Two workmen for 14 days	9
Loss 3 cwt.	9

therefore 100 cwt. as exported from here cost 327 florins, and add to this

	Florins.
50 cwt. flux	400
Wood to melt	42
4 workmen for the melting for four weeks at the rate of 2 florins per week per man	36
Other expenses	25

or a total of 830 florins for 100 cwt. He calculated in the same way the cost in Holland at 1,000 florins. Now as a hundredweight sold in Hamburg for 20 florins, therefore the profit was 100 per cent. The Prince should give him an advance of 5,000 florins for his works and they would take charge of it, but they must first take a trip to Holland and England in order to make contracts with the dealers for large amounts. As remuneration they asked 20 per cent. of the profits. The Prince did not consent to this proposition of Berckau's. The result of this proposition and consultations was the royal decree of 1609, in which it was made known that for the future the Prince would buy up all the cobalt made in Schneeberg, which was formerly taken by foreign merchants and sent out of the land. The purchase was to be made through the tithe collector. The works producing cobalt were directed not to sell their cobalt to any one else under a penalty of 500 florins, and all the dealers were forbidden under the same penalty to buy cobalt without the consent of the Prince, or to dispose of their stock on hand either in or outside of the country. The Schneeberg cobalt trade thus became a State undertaking.

SCHNEEBERG COBALT AND OXIDE TRADE AS A STATE UNDERTAKING

The first consequences of the change of the Schneeberg cobalt and oxide trade into a purely State undertaking were decidedly favorable. The stricter organization, and the greater capital which the new management could command, led in the first place to a rise in the price and increase of the sale. This operated in favor of the cobalt miners, even although it must always be kept in mind the money bags of the rulers profited by the change. In the course of time, however, the financial difficulties under which the Princes at that time almost always labored exercised a baneful influence. Their interests were always more and more put in the foreground, and they were willing to let the works get under control of capitalists who were able to make large loans. These concessions would be given for a period of years. It must, however, be acknowledged that, as a last resort, the mining office stepped in on behalf of the cobalt miners and the Prince generally followed the advice of these officials and remedied the most crying evils. Moreover, the terrible industrial crisis began to make its influence felt. This was brought about by the practice of clipping coins and by the Thirty Years' War. These circumstances led to a complete ruin of the Schneeberg cobalt mining and the oxide trade about the period of 1620-30. We will look into these circumstances more in detail shortly, but must first notice the organization of the cobalt and oxide trade as it existed after the conversion of the industry into a purely State undertaking.

Ordinance of 1609

According to the ordinance of the Prince in 1609, the tithe-collector in Schneeberg had to take over all the buying and selling of cobalt and oxide. The first task was to find a buyer for the cobalt purchased from the works and the dealer, Kreifinger, applied to the Prince for a fixed contract. The following agreement was made with him in 1610. It was for a period of six years: All oxide colors which were produced during these six years in Schneeberg and were of good quality were turned over to Kreifinger. He had the power to sell his oxide wherever he wished, but he must first supply the business houses of the Principality with these wares. Kreifinger had two Leipzig merchants as guarantors. The price per hundredweight was six gulden and ten groschen and notice had to be given half a year before expiry of the contract. Kreifinger had to advance the Prince 3,000 florins, and he was to receive back 500 florins per year and the interest. Some alterations were made in this contract afterwards to the effect that the oxide was divided into two classes. These changes were in consequence of complaints on the part of the contractors. They objected especially to the fact that all the oxide that was produced in Schneeberg should be accepted by them, and therefore every year fixed amounts were agreed on. The whole management of this business was left to the tithe-collector. He had to look after the purchase and taxing of all the cobalt ore delivered by the works, then deliver them to the contractors and carry out all the bookkeeping. There were numerous complaints on the part of the works that the tithe-collector estimated their cobalt too low. The bucket of cobalt ore was paid for at the rate of two to three florins, and the hundredweight of oxide three or four florins. This task soon became too great for the tithe-collector. He therefore requested assistance in his work, and a couple of officials were allotted to him. These two officials were to inspect and estimate the cobalt in the presence of the tithe-collector and agents of the contractors, to look after the roasting of the re, visit the stamp mills weekly, weigh out the color for the dealers, and keep strict account of all color that was made.

An attempt was made to induce the Prince to cancel the contract with Kreifinger. He was accused of being a swindler, who had already been in jail. At the same time proposals were made to make the color in Saxony. In spite of these objections the Prince stood by the contract, and even renewed it for six years more. According to this later contract the Prince had to deliver yearly 3,500 hundredweight of oxide, 3,000 at 8 florins and 500 of inferior quality at 6 florins. Kreifinger, in consideration of this, made the Prince a further loan of 4,000 florins. These advances on the part of the contractors to the Prince were characteristic of all the concessions.

Troubles of the Miners

A few years after this, namely, in 1616, the cobalt miners petitioned for a remission of the tax on the ore and for a higher price for their cobalt, as mining was getting more expensive all the time, and the ore scarcer, and prices for necessary articles were always rising. The tithe-collector suggested an increase of half a florin on the bucket.

In 1617 the following ordinance was made:

1. All the cobalt ore must be inspected by the officials before it is rated and taken to the ore house in order to determine from which mine it came and to see whether good and inferior ore were not mixed together. For this inspection the mines had to pay each time two groschen. The previous taxes were maintained.

2. No robbing of the mine was to be practised.

3. No miner was to go underground more than two shifts in the day.

4. All the cobalt purchased from the works was to be kept separate and roasted by itself in order that the tithe-collector and the superintendent of the cobalt could settle correctly with the different works, and in order that the cullings-out could be replaced by the different works.

5. The assayer had to take a sample from each cask of oxide, and this was to be kept in the office.

6. No cobalt ore was to be stamped either by night or on holidays.

7. Two buckets were to be kept and filled with ore by the works, one of which the tithe-collector was to receive and the other the mining office.

8. The officials had to inspect the color works weekly, and the ore-dressing plants, and no one had any right to enter the stamp mills without permission.

9. Every cask of color was to be weighed and stamped with the Prince's trade mark. The color was to be sold by the hundredweight to the merchants in Holland.

Unfortunately, however, these rules were not observed, and we see that shortly afterwards the works were complaining over the tithe-collector, Roehling's, practice of culling out. The cobalt that was delivered by the works was not kept separate, they stated, but all mixed together, and then the works were compelled often to replace more ore than was culled out than they had sent in the first place—for instance, one mine which had delivered 53 buckets of cobalt was ordered to replace 64 buckets, and moreover they said this ostensibly culled ore, which was often better than the cobalt that was accepted, was not sent back to them, but was taken sixty miles and farther sometimes—they would like to know why. They said that the tithe-collector was always in debt to the works, so that they were compelled, in order to carry on their mines, to borrow capital at high rates of interest. Therefore they requested that Roehling be ordered to cull out the ore from each work separately, and to give back what was culled out in order that they could pay off their workmen properly, and they also asked that the tithe-collector should pay them in full every half year, or if not, that the Prince should allow the works, after this contract was run out, to work up their cobalt to oxide themselves and sell it as they might. They offered to give the Prince, if the tax of one-twentieth was repealed, for every hundredweight of oxide one florin. They stated this would bring in more than came from the contracts now. The Prince promised to look into the matter of the excessive culling by the tithe-collector, and to give them an answer about this open dealing after the contract expired. In the same year the works made another complaint about their being in arrears with their payments. They stated that they were no longer in a position to pay their workmen, and they had to keep on borrowing money at high rates of interest.

Coin Clippers Period

We come now to the time of the Thirty Years' War and to the general money crisis in Germany, which is known as the time of the Coin Clippers. The consequences of the war were noticed in Schneeberg after a few years, but the tremendous money crisis was felt at once. In Germany for some time there had been excessive clipping of coins going on, and in consequence of this currency of full value was vanishing, and the

country was flooded with depreciated money, thereby bringing about a tremendous increase in the price of all articles. This money crisis was all the worse because it coincided with the Thirty Years' War, by which trade was crippled everywhere. In consequence of these two circumstances the production fell greatly, from over 8,000 buckets in 1620 to about 2,000 in 1639.

The cobalt miners regarded the contract which the Prince had forced on them as the sole cause of their desperate position. They were no more able to recognize the true cause of the industrial crisis than their contemporaries. Their object, therefore, was to have this contract cancelled and to obtain unrestricted trading in their cobalt and oxide without the intervention of the tithe office and foreign dealers. They therefore asked in 1619 for the granting of open dealing in cobalt, and the Prince told them that after the contract ran out in 1620 he would give them an answer. The Prince was, on his part, too much dependent on the support of these foreign dealers, as it was only with their large capital that he was able to undertake the extensive business involved, and the contractors, on their part, were quite content to have the concession as a guarantee for their debt. He therefore could not entertain the wishes of the miners.

The Prince renewed the contract with the Dutch for six years, but it was finally cancelled, as the contractors only wished to take yearly 3,500 hundredweight as before, while the Prince demanded the purchase of a larger quantity. In spite of this the Prince would not grant open dealing, but made another contract with some Leipzig merchants and others. The contract was for twelve years. The Prince agreed to deliver them yearly 6,000 hundredweight, and the contractors could deal with these either at home or in foreign markets, but they must first supply the dealers of Saxony. If the contractors could not get rid of the color afterwards they could keep it in Schneeberg in some of the offices, and in the meantime no one else should be allowed to deal in color, and the Prince would give a patent against cobalt smuggling. On their side the contractors must agree to take the 6,000 hundredweight yearly, even if war broke out, and stopped trade, and they must pay in cash 5,000 cwts. at 8 florins, and 1,000 cwt. of inferior quality at 6 florins. Payment must be made in good French money.

Loans from Contractors to Prince

In the autumn of that same year the Prince applied to the contractors for a large loan. He explained to them that he required 50,000 florins for a very important matter, and requested them to advance this money. They declared that it was at the moment impossible for them, but they would manage to do it in the course of six weeks, advancing the money at seven per cent. Some time afterwards they said that they were ready to advance the 50,000 florins if the oxide trade and the purchase of the cobalt was made hereditary and irrevocable to them, and that they should buy the cobalt by their own agents and work it up to oxide themselves without the royal tithe-collector having anything at all to do with it. For this privilege they would pay the Prince 4,000 gulden yearly. The Prince agreed to this unheard-of demand without hesitation. The contractors were to make the payment and the tithe-collector to be notified of the fact.

Intervention of Mining Office

This doubtful step was not carried out however, as the mining office took a hand in the affair and explained to the Prince that this proposal was contrary to all mining rights; that the miners would leave, and then he would lose the 4,000 florins which he got from the contractors, while the cobalt mining had brought in the Prince yearly up to the present time about 6,000 florins. This concession was never formally withdrawn, but is never mentioned again, and matters remained as they were, the contractors lending the Prince 17,000 florins, which the Prince set down to the credit of the works. In the next year the works sent an urgent request to the Prince to pay them for their cobalt that was delivered, that there was 17,000 florins overdue from the tithe-collector, and they further asked for payment in good coin of the land, and not in copper coins from Brunswick, which they could not get rid of. They stated that all necessities

and appliances were advancing at a terrible rate, the price being about three times what it was before, so that a great many had to leave on account of the expensive living, and finally they expressed a desire for open dealing again, and requested an extra payment for the cobalt. The mining officials agreed, or gave a favorable report on this petition, and suggested that they be repaid the 17,000 florins and get half a florin more per bucket for their ore. This was done by the Prince. The contractors, on the other hand, were not by any means satisfied. They had expected a greater profit for their undertaking than it really gave, and thty complained continually about cobalt smuggling, further, they objected to the tithe-collector at Schneeberg,—that he delivered them oxide that was no good. The Prince therefore ordered a strict inspction by the mining office, as these complaints had become too frequent. The remonstrances, however, continued till finally the Prince ordered an investigation. In consequence of this investigation the Prince took away the control of the outside works entirely from the tithe-collector, and put them in charge of a new officer. This concession did not satisfy the contractors; in the meantime, in order to get rid of the contract, they had made an agreement with one Brandenstein, and in consequence of this they stated that they had everywhere found opposition, and reverses with their contract, and they feared great loss, if not complete ruin. Therefore they requested the Prince to hand over their contract to Carl Brandenstein.

The Prince was heavily in debt to Brandenstein, who was a money-lender of the worst kind. He had lent 22,000 florins of depreciated money to the tithe office, and probably he expected to recoup himself with the oxide trade of Schneeberg. He did not succeed in this, however, as his inconsiderate treatment of the miners overshot the mark, so that he had to abandon the contracts. He had asked the Prince for the most complete and untrammelled powers in the direction of the business for twelve years. According to the contract, Brandenstein would take over the purchase and the preparation of oxide. All the directors of the color works and all the employees of the Prince, except the mining officials in the mining office and tax collectors, were to be put under the direction of Brandenstein, and he had the power to dismiss them or fill their places, after notifying the mining office. The new officials would then be engaged by the Prince and turned over to Brandenstein, who was to pay their salary. The cobalt ore was to be paid only in good coin, but the works had to deliver good, pure material. Material that was worth less than 3 florins need not be paid for at all. Any ore that was not good would be put aside and could not be sold. All good cobalt Brandenstein was forced to accept, but he need not pay for it at a higher rate than five florins, and he must pay in good coin. All the color works and stamp works which were in bad repair Brandenstein was to take over and he would be recouped for the expense of repair after the expiry of the contract. He was to receive wood out of the Prince's forest at the usual price and in addition to the stamp work he might build a new cobalt works, the cost of which would be refunded to him. He should have the stamp works belonging to the tithe office as long as he wished for one gulden weekly rent; in consideration of his previous advances the whole stock of oxide, etc., and 16,900 buckets of cobalt were handed over to him. He could make this up to color and sell it wherever he wished, and in consideration of this he had to pay the works the money that was due, but they had to first replace the ore that had been culled out with good cobalt. After the expiry of the contract Brandenstein or his heirs had a prior right to a renewal of the contract. If the supply of cobalt ore failed the contract would be cancelled and Brandenstein had to see that the various taxes were all paid.

Disputes between Miners and Contractors

We see that by this means the Prince had handed over the trade in oxide, which had been very profitable to the Treasury, to Brandenstein for a period of twelve years without any further consideration except that the Prince was free from the responsibility of paying his debts to the works. Immediately after the signing of this contract a bitter quarrel began between Brandenstein and the works. They demanded payment

of the balance of over 30,000 florins which was due them for cobalt which they had delivered. Brandenstein put every obstacle in the way; he demanded the replacing of the ore which was culled out, and stated that the stock on hand was a great deal smaller than was represented to him at the time when the contract was made. The works on their part, objected to the excessive culling. They would have to close down their mines and send off all their men, who already lived in the most wretched state of poverty. They stated some were even dying of hunger. Their creditors were threatening to evict them from their mines, and the adit was in danger of caving in, as they had no means to keep it in order, and furthermore they complained especially about a wilful underrating of their cobalt and of the low price. In spite of the efforts of the higher officials of the office to induce Brandenstein to accept some of the lower grade cobalt and to pay up the outstanding amounts of the works, he obstinately stuck by the letter of the contract, and complained that he was losing by it. The works did not let the matter rest. In spite of a sharp notice from the Prince about their inopportune grumbling they continued to send complaint after complaint, always about the same points, and with the same conclusion, namely, that they should be allowed open dealing for their cobalt. Brandenstein finally gave way to this uproar raised by the works, which was backed up in the most essential points by the officials in the mining offiec. He therefore voluntarily cancelled his contract with the Prince and the Prince gave permission to the works to make up the cobalt to oxide themselves, and to deal with it as they wished, but they had to pay the regular taxes, and in addition to that one florin for every bucket of cobalt made up to oxide. Smuggling in cobalt would be punished by a fine of 500 gulden.

Open Dealing Not a Success

The cobalt works had reached the desired goal, and they hoped that with that all their difficulties would be at an end. But very soon the opposite became evident, and although the management of the State might have been a great deal to blame for what had happened in the last few years, it was not the only reason for the decline of the Schneeberg cobalt mining. It was rather dependent on the general industrial and political crisis under which all trade and industry languished, and the general purchasing power of the public greatly diminished. This was especially noticeable in an article which was not absolutely necessary, such as the color, and in times like this it was the small works and those with less capital which necessarily suffered most. We hear, therefore, a few weeks after open dealing had been allowed, strong complaints on the part of the works. They stated that in addition to the tax they should not be required to pay one florin for every bucket of cobalt,—that Brandenstein had ruined the whole business and no human being was willing to buy any color from them. The cost of mining a bucket of cobalt was two or three florins, and if the expenses were so great they would have to discharge their miners, and therefore the Prince should remit the one florin on the bucket of cobalt. The Prince granted this request in part, and an inspection was ordered of all the works by the tithe-collector, and that the adits should be kept in repair where there was any danger of a cave-in or other damage, and they were further to see that the barren rock did not remain in the adit, but should be brought out to the surface. For the purpose of collecting a tax they should inspect all the mines which were producing every two to four weeks, and be present when some of the ore was hoisted, and should cull the cobalt in proper manner and measure it up. The works were not satisfied with this. The Prince pointed out that the office, the mining officials and the works had made representations about excessive taxation, and that the works had said they were ready to pay these taxes if they got open dealing, and that they stated they would find enough buyers who would take their cobalt at ten florins which they were forced to sell at five. Now they said the very opposite.' They were to blame themselves. In spite of this he said that he was willing in the future to take the tax of one florin a bucket and remit the mining taxes.

As soon as an opportunity offered the Prince made one more effort to close a new contract. Two men offered to negotiate; one was the merchant, Hans Friese, and the

other was from Frankfort, Daniel de Briers. Both declared that they had bought a great quantity of oxide, but the business had not succeeded, as in the previous years a great deal of very bad material had been made, still they were willing to go on with the venture if a monopoly was given for from one to three years. The Prince seized this opportunity immediately and made a contract without consulting the Schneeberg cobalt works. It was for six years. According to this the two contractors were to take yearly from Schneeberg and Neustadtlein 3,000 buckets of cobalt. The payment should be made according to four grades. The No. 4 grade was to be considered as absolutely worthless, and the first three grades were to be paid respectively with 3, 2½ and 1½ reichstaler. The samples were to be kept in Schneeberg and the cobalt was to be taxed according to them. The cobalt, as soon as it was taxed, was to be delivered to the two contractors, who could make oxide of it and deal with it at home or abroad, as they liked. The payment for cobalt was to be made to the works immediately by the contractors in cash without any deductions, that is, neither the Prince nor the tithe office had anything to do with it as formerly. The latter had nothing more to do with the trade, but merely inspected it through the mining office. Moreover, the contractors were to take the cobalt ore which was paid in to the Prince as mining taxes by the works, and also that which was mined in his own mines, at the price of three florins a bucket. At first the contractors were not to export their cobalt and oxide from Schneeberg, in order that the business might recover its reputation again, and all dealing in oxide and cobalt was strictly forbidden to all other persons during this period of six years, but in consideration of this the contractors were bound to take yearly 3,000 buckets, even if war broke out and stopped trade, and if more than 3,000 buckets were mined in one year the excess would be kept for the next year. For this privilege the contractors were to pay yearly 1,000 thalers into the Prince's exchequer, making it in two equal payments, and also pay rent for the works belonging to the Prince which they took over. If the contractors, after the six years, did not wish to renew the contract, they must give a half-year's notice; on the other hand, if they wished to go on they would have the refusal over others.

Contract versus Open Dealing

This contract was submitted to the works, who immediately opposed it, as they declared that it would mean the certain ruin of the whole mining industry. They straightway came to the Prince with a petition about the contract, and to request the retention of open dealing, and they especially complained of the small quantity of cobalt which was to be bought, namely, 3,000 buckets, and of the low price, stating that, under these conditions, they were doomed. They begged, therefore, to have the contract cancelled, and to stick to open dealing. They promised to pay the tax most punctually, and to abstain from any smuggling on their part. In order to meet the works somewhat in this respect the two contractors stated in writing that although they were not, under the existing circumstances, in a position to take more than 3,000 buckets, nor to pay any more for it, they would be willing, if the conditions improved, to buy a greater quantity of cobalt and pay a little higher price. This declaration on the part of the contractors, which was not really of any value, did not remove the opposition of the works, but it had the effect that the works now divided into two parties,—one which declared that they would like the contract provided there was a greater quantity bought, and the price were a little higher, while the other party still opposed the contract. The party which was irreconcilably opposed to the contract persisted that if they got open dealing they would give the Prince, instead of the tax of one-twentieth, every tenth bucket, while the other party stated that this offer could not be accepted, and wished for a fixed contract, however, with the conditions mentioned above. Negotiations in this matter dragged on for some time. The contractors finally agreed to take 4,000 buckets annually, but stated that an increase in the price was impossible at present. The mining office stated that the prices offered to the works by the contractors were not reasonable, as the costs in mining were too high. However, offers

and counter-offers were made, and as a final result the Prince asked for a vote from the works of "contract" or "open-dealing." All the works which were producing ore must state in writing whether they were for a contract or for open-dealing. The result was that 30 persons, representing 87 mines, voted for the contract, and 43 persons, representing 132 mines, voted for the open dealing. In consequence of this majority for open dealing the Prince decreed that the contract was cancelled and permitted open dealing again, with the condition that every tenth bucket of good pure cobbed cobalt ore should be paid into the Treasury, and in addition to this some other taxes, which could be paid in money or cobalt. Those of the works which had received advances from the contractors, or had ore to their credit, should settle the matter with them.

Crisis in the Industry and Effect of War

We come now to the saddest time for Schneeberg cobalt mining. In 1629 the works requested, instead of every tenth bucket, that they should give every twentieth, as they could not get ready cash for their cobalt no matter how cheap they were willing to sell it. This request was repeated in 1632, and at the same time they petitioned for the establishment again of a fixed contract. This, however, considering the bad position of all commercial and political matters, was an impossibility, especially as all the foreign contractors had had bad experiences with their contracts, and were not willing to bind themselves for any length of time. A good idea is given of the conditions and the position of the Schneeberg cobalt mining at this time in a report of the chief official of the mining office in the year 1631. According to him the works since about 1628 had found almost no sale for their oxide because the Dutch had withdrawn entirely from this trade, and they were the ones that had bought up most of the oxide before. Moreover, the war had been spreading all the time, so that all the passes in the mountains were guarded, and all trade was blocked. The works had sought to sell their goods themselves, but they had to dispose of them at a very low price, and at a loss. Sometimes they were not paid for in cash, but in goods, which they could not sell again without a loss, and they had been compelled to pay thir workmen in the mines with cobalt, which they had to sell dirt cheap in Bohemia in order not to die of hunger. It was true that a decree had been made that the workmen were to be paid with money, but there was so little of it in the country that they were afraid that if this decree was observed the mining must be stopped altogether. In addition to this misfortune it seems that about this time Schneeberg suffered directly in the war. In 1632 the Croatians swept down on Schneeberg, took the town and sacked it and ruined many of the mines. At that time the population of Schneeberg was only about 2,000, whereas it had been over 3,000 in the year 1600. In consequence of the lack of money they had neglected to carry on the necessary repairs in the adits, and as a result many of the mines were flooded. The deepest adit caved in about that time, and they were not able to mine any more in consequence of an inrush of water, and the production of cobalt fell off. It is believed that shortly after this there was not a single mine in Schneeberg which made any profit, as at the very most they could only get about 25 groschen for a bucket of ore, while the mining of it cost a florin or more, and in addition to that they had to pay some tax. The only exceptions to this were three mines, which made a little because they had some bismuth.

THE PROSPEROUS TIME FOR THE SAXON BLUE COLOR WORKS

After the year 1628, instead of a fixed contract the cobalt works were allowed to deal with their ores as they wished, without improving the position of affairs at all. We have seen, moreover, that the conditions for mining just at this very time were exceptionally bad. The production of the mines had sunk considerably, and did not begin to increase until after the forties. This was brought about, as we saw, by the depreciation of the coinage. That and the blocking of all trade with foreign countries because of the war, and the other devastations which the war brought with it, had brought the Schneeberg mining into a desperate state, from which there did not seem

to be any escape. This unfortunate period had caused most of the works to see that their position was better under the cobalt contracts which they had fought so hard against, even although they did not receive the principal advantage themselves, which went rather to the contractors because when they had open dealing and the times were uncertain the works which lacked capital depended altogether on foreign dealers. Moreover, the worst of the storm of war was past. It is true that in 1642 Schneeberg was sacked again by the Swedes, but on the whole more peaceful times were dawning, and moreover the cobalt mines had been producing better ore for some time. As the result of all these causes a gradual wish began to be expressed for a general contract and the establishment of color works in Saxony, a plan which, if successful, would probably give cobalt mining a sounder foundation than the sale of cobalt and oxide to foreign dealers. Some offers were made by different parties which were not accepted, as there was no guarantee that they would be able to carry out the contracts, and after some considerable discussion and negotiation the Prince summoned the principal officials of the mining office, the civic officials and whatever contractors were willing to bid, to meet together and lay their proposals before him, to see if they could make a contract by which the works could sell a fixed amount of good, medium and low-grade cobalt, the payment to be in cash, according to the assays of the ore. The small works, too, which could only mine a little cobalt, were to receive consideration, and moreover all the wages were to be paid in money, and not with color or cobalt. The sale of cobalt to Joachimsthal in Bohemia, was to be absolutely forbidden, and if they did not succeed in closing a contract the Prince was to receive a report as to how far they advanced, together with advice as to what should be done in the meantime. Before these officials had finished the task set them by the Prince an advance was made towards this goal from another quarter. In March, 1641, the Hamburg dealer, Hans Friese, made a private contract with six of the cobalt mines in Schneeberg. This agreement was filed in the mining office, and it contained express provision that the contract should be cancelled immediately the Prince succeeded in making a new one. The substance of it was as follows: Friese was to take from the works in question for three years 300 cwt. of cobalt, and was to pay them in cash immediately on delivery at the rate of two thalers and six grochen; the works could easily receive a part of their payment from Friese in goods and should the works mine more cobalt, this excess was to be offered to Friese first, and if he did not wish to take it they could sell in any way they liked. The cobalt should be pure and thoroughly cobbed out, without any hornstone, slate or pyrites. The first delivery was to be made at Easter, 1641, and then every six weeks following—smaller contracts were made by others with different mines. In the meantime the officials who had been commissioned by the Prince to make a contract had not been successful. This was due chiefly to the opposition of Hans Burkhardt, and therefore the mining office ordered that a temporary contract should be made, and for this temporary contract Hans Friese and Schnorr made a bid. Schnorr had, a short time before that, built a small color mill, and wished to work up the Schneeberg cobalt there, and he stated that he was willing to contract for a year on condition that during this time no blue color work should be built in Saxony. This contract was actually agreed on between these two and twenty-three of the works. In consequence of this further development of matters, Burkhardt gave up his former opposition and declared that he was willing to take part in the contract on condition that he should receive permission to erect a blue color works. The only opposition now was from Röhling, one of the contractors. He said that he had made a former contract with some of the Dutch, which he must adhere to, as the Dutch dealers had made him an advance, and if he cancelled the contract the money would have to be refunded. After his contract had elapsed he said he would be willing to join. The mining office, however, believed that it was not necessary to pay any attention to him, as his contract with the Dutch dealers was not recorded in the mining office, and was, therefore, not binding.

Local Customs Works, 1642

As a result of the conference, lasting several days, between the Prince and three of the contractors, namely, Friese, Schnorr and Burkhardt, an agreement was made which embraced all the Schneeberg works. It contained the following points: The agreement was between all the works which existed at Schneeberg and Neustadtlein and the contractors Hans Burkhardt, Hans Schnorr and Hans Friese, and made with each of the three individually and not jointly, for a period of six years. The three contractors above mentioned were to take from all the works, including the Prince's and their own, yearly a quantity of 2,400 hundredweight, and they were to pay according to samples which were to be kept in the mining office. The payment was to be in good money and at the rate of 3 thalers 18 groschen per hundredweight for No. 1 grade, 2 thalers 18 gros. for No. 2, and 2 thalers for No. 3. Cobalt ore which was better than these three grades or not equal to it, should be paid by the contractors according to the decision of the mining office. Each of the contractors was to take 800 hundredweight. The mines, on their part, were required under penalty of a heavy fine, to refrain from dealing in cobalt or oxide with any one else during the period of this contract. If one of the contractors should die, his heirs would be bound to carry on the contract until it expired. Friese had permission to export his cobalt, Burkhardt was allowed to build a color mill in Saxony, and Schnorr was to be also allowed to build one there and work up his cobalt. The agreement was finally confirmed by the Prince in 1642, and a decree was made against cobalt smuggling. In this decree every sale of cobalt in violation of the agreement, especially the sale into Bohemia, was to be punished by a fine of 500 florins, and if the fine could not be paid, corporal punishment would be substituted. The informant would receive one-half of the goods which were confiscated and the other half would be used for maintenance of the adit in Schneeberg. In accordance with the royal permission, Hans Burkhardt settled in Oberschlema, near Schneeberg, where he had picked out a site for his color mill. It is true there was some opposition from the town council of Schneeberg, which regarded this as an encroachment on their rights and jurisdiction, but on account of the concession granted by the Prince it was allowed to stand.

This new contract soon met with difficulties which endangered its permanence. At the very outset the works and the contractors were in dispute about the assessing of the cobalt according to the assays that were made. The contractors complained that the mining office assessed the samples which were better than No. 1 too high, and that they had introduced intermediate payments. The Prince decided that these intermediate valuations should not be used, and threatened with severe punishment those who did not obey. The samples which were better than No. 1 should be graded as No. 1, and those which were better than No. 2 but not quite as good as No. 1, should be graded as No. 1. If the differences were much greater, then they were to be paid according to the next lowest grade, and all ore which was not up to No. 3 grade need not be paid for at all by the contractors. The works were advised that by care they would almost always reach that grade. The Prince also warned them that they must keep the contract or they would not find any one to buy their cobalt.

A more serious danger threatened the industry in the following year. This was due to the death of Hans Friese. According to the terms of the contract his heirs were bound to carry it on, and as a matter of fact his widow tried this, but on account of lack of capital she was unable to carry out her obligations, and finally one of the principal creditors, Oehme of Leipzig, took over Friese's contract. A few years later, in 1647, after the expiry of the contract, which was made in 1641, all the success that had been achieved hitherto was jeopardized. Burkhardt refused most positively to make a new contract, even although the Prince threatened him if he persisted in his refusal to cancel his right to have blue color works, but Schnorr and Oehme stated that without Burkhardt's assistance they were not in a position to buy all the cobalt from all the mines, and they would therefore make provisional contracts with individual works. The works on their side, were not satisfied with that, and requested again for

permission to have open dealing, as they could not get any other contractors. The Prince against his will granted their request and allowed for a short time open dealing again, with the exception, however, that all trade with Bohemia was prohibited, because the Bohemian works, on account of the scarcity of their ore, were only able to exist with the help of the Saxon cobalt, which was of better quality. They then competed with Saxony in the color business. Not very long after this another individual named Schindler purchased a site in order to build blue color works, and in conjunction with the mining office and with the Prince's permission, he stated his willingness to enter into a contract. Finally an agreement was made for six years in 1649, according to which the four owners of the four Saxon color works, namely, Burkhardt, Oehme, the widow of Schnorr and Schindler were associated. The amount of cobalt which they agreed to take yearly was the same as before, namely, 2,400 hundredweight. The price remained the same as before, with the exception that one higher grade was introduced, was called No. 1 and was paid at the rate of 4 thaler 6 groschen per cwt. In all other points this agreement was the same as the previous one. Each one of the contractors was to take 600 hundredweight yearly. Both the works and contractors were forbidden most strictly to deal either in ore or oxide with Bohemia, and all the pearl ash, that is potassium carbonate, which was produced in Saxony was to be delivered to the four works in equal portions. This contract was ratified by the Prince in 1649.

Contract of 1649

By this means a fixed and certain contract was brought into existence again. In the place of frequently changing foreign contractors, four subjects of Saxony acted, each of whom was in possession of a color mill, and therefore had an interest in the preservation and continuation of the contract. The only one who had previously been opposed to this was Hans Burkhardt, because he was able without any contract to supply his works with his own cobalt ore. Thanks to the energetic efforts of the Prince and his officials Burkhardt finally yielded. It is true that some concessions were made to him in the new contract. It was theerfore of great importance that in the year 1651 the Crown Prince, Johann George, came into possession of the Oberschelma works and Burkhardt's cobalt mines. Burkhardt had died without heirs or relations, and in his will he had left to the Prince his four mines and all his works. The only reason that he gave for this was that the mining and the color business might remain as it was. By this means the Prince had more direct interest in the mining and color industry than he had before. At the same time a request came from some foreign company that they should receive permission for the erection of blue color works. The four contractors, of course, opposed this and requested that for a period of twelve years no new color works should be built in Saxony. They stated that the production would be overdone if further concessions were given, and the individual works would only ruin one another. They stated that there was an example of this in Bohemia where, after the erection of several mills, they had all been ruined except one, and moreover they stated that the pearl ash which was produced in Saxony was not sufficient for the four works which existed. They had to import two-thirds of their pearl ash from Bohemia.

The mining office agreed with this request of the contractors for the reasons given above, and advised granting a concession for twelve years on the condition that the contractors after the expiry of this contract should be willing to make a new one. It was certainly, under these circumstances, a good thing for the other proprietors of color works that the Prince himself was interested in one of the four. After some hesitation and urging on the part of the mining office, the Prince agreed that no new rights to build any color works should be given in Saxony. On their part the contractors were bound not only to keep the present contract strictly, but after its expiry to make a new one under more reasonable conditions "in order that the work which had so well begun should come down to posterity and flourish in vigor."

We see that by this means the foundations were laid for an industry which has lasted to the present time, for after the twelve years had elapsed, although there were

some attempts to build new works in Saxony, the four works that existed at this time were rooted so firmly that every attempt to encroach on their privileges was bound to fail.

CONCLUSION

The Period from 1653 to the Present Time

According to the agreement mentioned above there were four works, each of which was bound to take a certain quantity of ore yearly. One of these works was considered as a double one, and therefore the whole quantity was divided into fifths. The Oberschelma work was the double one. It will be noticed that one of the works belonged to the Prince and the other three were private. The three private works, which had been originally quite independent, in the course of time gradually came out of the control of single individuals into companies, which became more closely related to one another. As far back as 1659 the holders of the different works were agreed on the following points:—

1. All the works bind themselves to a fixed price for color below which no color may be sold. The common color cost 5 thalers per cwt. and the best color 10 thalers at the works. At Leipzig it was half a thaler per cwt. higher, and increased with the distance from the works.

2. None of the works during the period of the contract was to make more than 24 cwt. of color weekly.

3. Each of the works had to brand its casks of color with a certain brand in order that they could distinguish their domestic color from the foreign or Bohemian.

Later on, in 1845, the three private works were amalgamated into one and concentrated at Niederpfannenstiel. The works belonging to the State at Oberschlema remained as it was. Both these combinations are in union and form the so-called blue color trust. This owns all the Schneeberg mines, as well as the mine and works at Modum in Norway. Between the two works the old arrangement with regard to the disposition of the cobalt and the sale of cobalt still exists, viz., two-fifths and three-fifths. In all matters concerning the cobalt business they act in concert and exchange experiences, and experiments are undertaken at the common expense.

Leaving Bruchmueller's work and turning to the annual official reports it appears that the two works employed last year 225 men, including office staff, and that the product amounted to about 674 tons in weight and about $836,000 in value. (Jahrbuch fuer Berg und Huettenwesen).

Present State of Mining in the District of Schneeberg, Saxony

The chief characteristics of the vein systems are given on preceding pages.

Taking the only mines which have any production at all worth mentioning, and looking at the reports of the last ten years or so, it is evident that the character of the vein filling has changed since the early days. Bismuth now occupies an important position, as, wherever the contents of ore are given the precentage of bismuth stands high. Quotations from the Annual Reports show this. (See Jahrbuch fuer Berg und Huettenwesen in Koenigreich Sachsen). Silver is quite insignificant in amount, less than two per cent. of the value being credited to this metal. Thus in the report of 1893 (later reports give the value of silver, cobalt, nickel and bismuth together) the amount assigned to silver, etc., reduced to our currency, is as follows:

Silver	$2,700 00
Cobalt, nickel and bismuth	157,335 00
Uranium	1,666 00
Quartz, specimens and tailings	1,080 00
Total	$162,781 00

In the report of 1905:

Silver, cobalt, nickel and bismuth	$148,581 00
Quartz, specimens, etc.	1,855 00
Total	$150,436 00

The value per ton was about $570.

The result of all the development work being carried on now, consisting of drilling, drifts, crosscuts, rises, and sinking,—in short, trying in every way to open up veins known to be productive formerly or discover new ones,—is that here and there a rather small body of good pay ore will be found. Evidently the early productive period is long past. Occasionally they encounter difficulties due to striking old excavations, with accumulations of water or to the caving in of old works. Most of the work appears to be carried on at a depth of less than 1,000 feet.

Below are given translations of extracts from the Annual Reports, extending back about ten years. The reports are all on one mine, or rather group of mines, which was referred to above as being the only one of any importance. It is called Vereinigt Kobalt feld. About half a dozen veins are mentioned throughout the reports. Some of these were exploited in the early period of mining in that district.

In the report of 1893:

"On the Junge Zeche Spat, (one of the most productive veins in recent times) in a drift of about 280 feet in length for a distance of 83 feet, solid bismuth ore sometimes ten inches wide with 30 to 50 per cent. bismuth was found, also concentrating ore along a distance of 183 feet. The minerals were bismite, native bismuth, smaltite, chloanthite, native silver, ruby silver, argentite, galena in vugs with mimetite (arsenical lead chloride), eulytite (silica of bismuth), cobalt bloom, chalcopyrite, chalcocite, and cinnabar."

"The most important strike in the whole district was made on a vein which was 16 to 24 inches wide and carried very rich bismuth cobbing ore for 52 feet in length and then concentrating ore for 296 feet."

"A body of ore 45 feet long with a considerable amount of roselite (lime cobalt arsenate) was found."

In report of 1900:

"Exploration of the most important vein, Junge Zeche, was undertaken. The productive portion of the vein ended at a depth of about 830 feet from the surface. (This was the case with most of the veins.)"

Report of 1901:

"In a crosscut 770 feet from the shaft a strike of rich bismuth ore, sometimes with disseminated ruby silver, also cobalt bismuth ore associated with pitchblende (uranium ore) and niccolite was made."

"A strike was made in the granite* over 230 feet from the slate contact, of rather a large bunch of bismite, with native bismuth. Near the contact the bismuth ore was richer and was ten inches wide."

"Another discovery was made in a drusy quartz vein over three feet wide where solid cobalt nickel ore was found on the hanging, and bismuth on the footwall."

Report of 1902:

"Junctions of veins proved especially rich in native bismuth. Along with bunches of bismuth ores were associated cobalt-nickel ores and uranium."

Report of 1903:

"From an area of vein surface of about 270 square yards about fifteen tons containing 19 per cent. bismuth, 4.3 per cent. cobalt and 2 per cent. nickel was taken" (the width of the vein not given in this case). "Another ore body containing 20.6 per cent. bismuth and 3.6 per cent. cobalt was found. The contact again proved favorable."

"In a vein 44 inches wide bunches of bismuth ore occurred."

*The granite is younger than the schists in which the veins are found, and underlies them.

Other strikes mentioned contained 7.3 per cent. bismuth, 5.6 per cent. cobalt; another 33.9 per cent. bismuth, 2.6 per cent. cobalt, and 1.3 per cent. nickel.

1904 report:

"Strike was made 24.2 per cent. bismuth, and 4.1 per cent. cobalt."

"A stringer was found containing pucherite (vanadanate of bismuth) showing throughout all the ore."

Report of 1905:

"Strike of ore was made 25 feet long (width not given) with 21.4 per cent. bismuth and 2 per cent. cobalt. Another strike of bismuth ore of shipping quality 28 feet in length and about 35 feet of concentrating ore. The vein was about 20 inches wide, consisting of quartz, hornstone with bands of bismuth ore and contained 28.6 per cent. bismuth as taken out."

These rare minerals and their associations are mentioned in order that those interested in the Temiskaming district may look up the descriptions of the various minerals and be on the watch for them.

It is remarkable that of all the metal mines, some hundreds in number, which once produced ore in Saxony, and which played such an important part industrially, and also technically, in the development of the art of mining, concentration and smelting, the cobalt-bismuth-silver mines of to-day are the only ones which are not operated at a loss.

REPORT OF 1911

According to this report the richest ore taken out was from a vein of which approximately 800 square metres vein surface were mined. The return for a square metre vein surface was about 22 lbs. metal, of which over 90 per cent. was bismuth. Reduced to our systems the yield was $28 per square yard vein surface.

In another mine (Marx Semmler Stolln) radio-active water was found in following a little cross vein from one of the old workings. In one place water coming at the rate of about two gallons per minute was strongly radio-active. In another place the quantity of water was three times as great as above mentioned with a radio-activity slightly less.

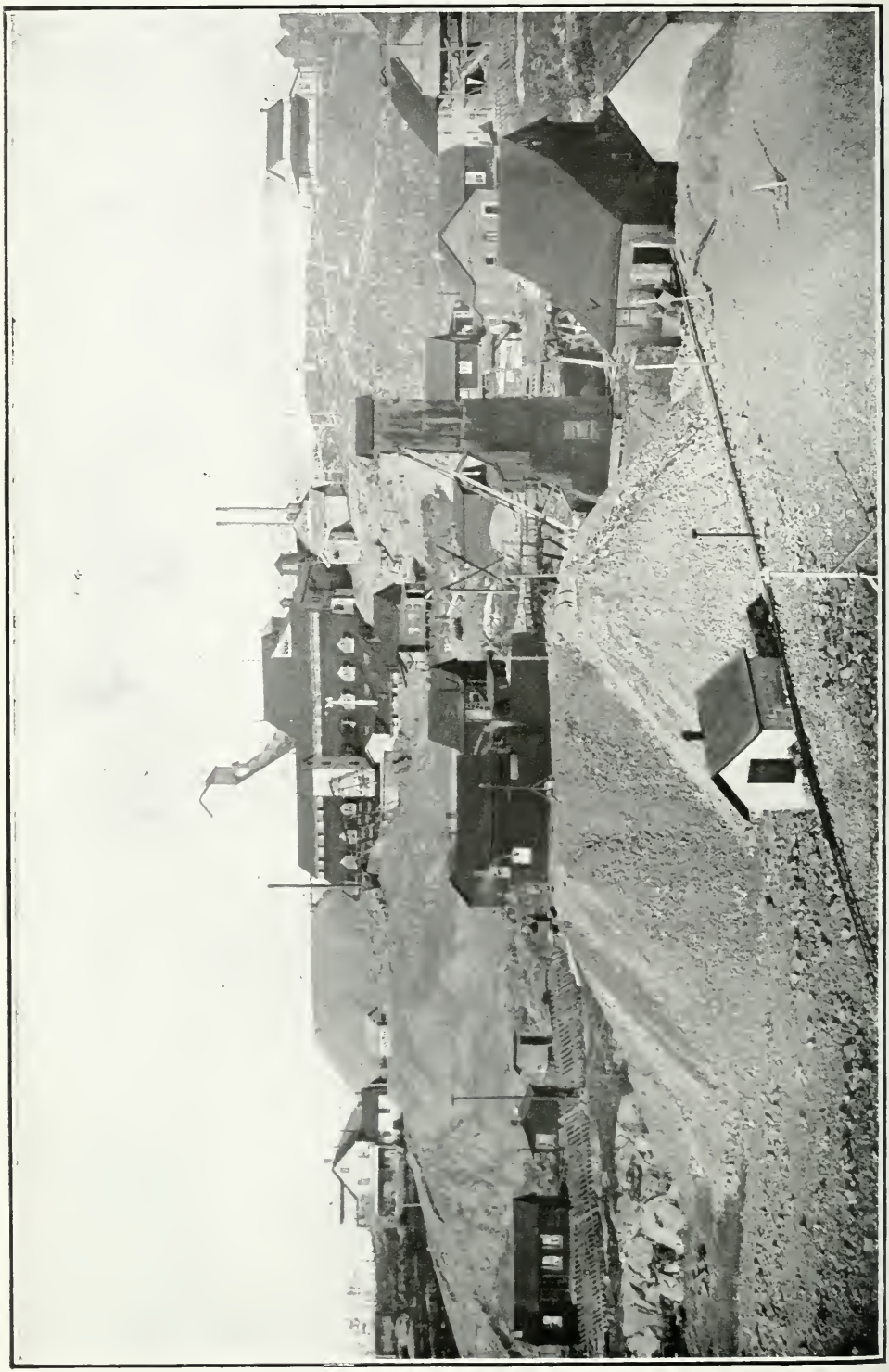


Fig. 109.—Coniagas concentrator and shaft house, with one of the Nipissing shaft houses in the foreground.

APPENDIX IV

MINING AND CONCENTRATING METHODS AT COBALT

By E. T. Corkill

Most important developments have taken place in the Cobalt silver mines since the third edition of this Report was published. The production of silver from these mines has raised Ontario to the rank of the world's third largest producer, surpassed only by Mexico and the United States.

Owing to the number of mining companies now concentrating their low-grade ore, it is misleading to compare the tonnage shipped with the shipments of former years. The only fair comparison is the number of ounces shipped. These shipments are given on another page of this Report.

The statistics show that up to December 31st, 1912, 44 mining companies in the Cobalt camp have shipped ore. Some of these companies ship from several mines, so that the total number of mines that have produced ore is in excess of this number. Of these 44 companies, 21 have paid dividends. This includes two mines, privately owned, the amount of whose dividends has not been made public. There are at present fourteen companies in the camp paying regular dividends, and one privately owned mine, so that the decrease in dividend payers has not been very large. The increase in dividends paid by certain companies more than makes up for the suspension of dividends by others.

Mining Methods

With the developments of the mines, a change has taken place in the mining methods. In the early days of the camp, most of the ore was mined from narrow open cuts. This was a cheap method for extracting the upper part of the high-grade silver veins, but, as the veins were followed to greater depths, more systematic methods had to be adopted, both for the extraction of the ore and for thorough prospecting underground. To accomplish this, small shafts, generally 5 ft. by 8 ft. inside timbers, divided into two compartments, one for hoistway and one for ladderway, are sunk on the veins. Stations are cut at intervals of from 75 to 100 ft., and drifts run on the veins from these stations. The shafts are practically all vertical, as are the veins. Most of the stopes are carried from 5 to 6 ft. in width, and overhand stoping is adopted practically all over the camp. When the veins are fairly uniform in values, timbers are put in over the drift and the rock and ore broken on these. Chutes are put in every 30 to 40 ft., and the surplus rock is drawn from these as the ground is broken. The rest of the broken rock is left in the stope, until it has been carried to the next level. In this way, the men are within a few feet of the roof at all times, ensuring safety, and are always within reach of the work without staging. In other mines, where the values of the ore change rapidly, and it is advisable to keep the waste separate from mill rock, all the rock is drawn from the stope as broken. Stulls heavily lagged are put in the stope about every 12 feet, and the men work from these. The walls of the stopes are as a rule quite solid, and can be made safe, if care is taken in scaling. As an evidence of this, the records show only one man killed to January 1st, 1913, from falling rock while working in the stopes of the mines at Cobalt. Owing to the narrowness of the veins, and the fact that sometimes the veins at the surface are either heavily covered by overburden, or only show cracks, it is necessary to do a great deal of exploratory drifting and cross cutting. The total amount of sinking, raising, drifting and cross-cutting done by the forty-four producing mining companies, up to January 1st, 1913, is in excess of 50 miles of work. More than 50 per cent. of this represents exploratory work. But little hand drilling is done at Cobalt. The companies use for development and exploratory work the machine drill with 3⅛ to 3¼-inch cylinders. The rock is hard to drill, but breaks well when drilled. The average number of 5-ft. holes drilled to break a heading 7 ft. by 6 ft. in a drift or cross-cut is 10, which make, when blasted, about 4 feet of progress. The hammer drill is used to some extent in stoping, but it has not been largely adopted by the companies, though it is used almost altogether for raising.

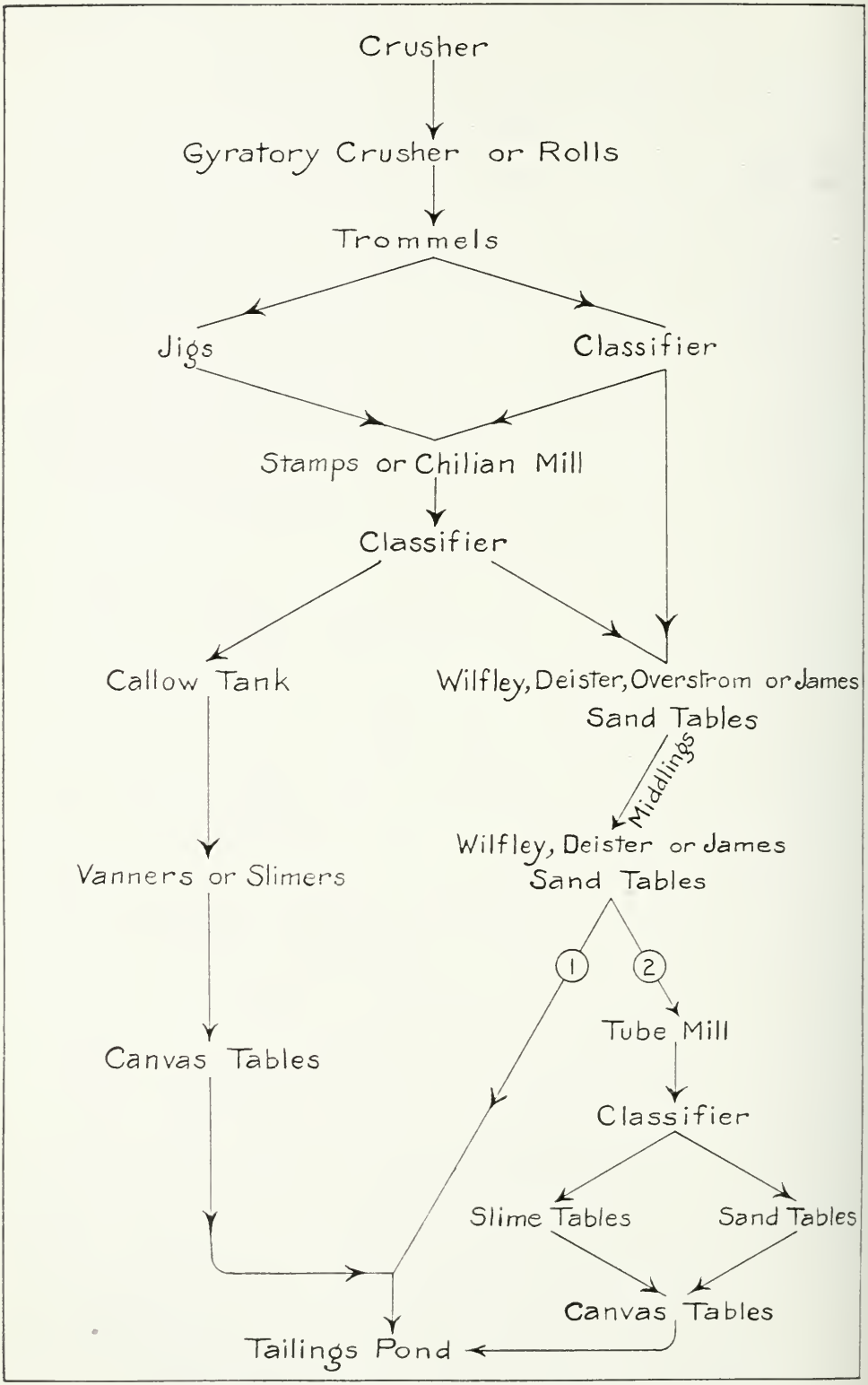


Fig. 110.—General flow sheet. Cobalt concentrators.

Power Development

The summer of 1910 saw the introduction of hydro-electric and compressed-air power into the camp. The Cobalt Power Company and the British Canadian Power Company supply electric power and the Cobalt Hydraulic Power Company compressed air. The British Canadian Power Company also supplies compressed air generated at Cobalt and at Brady lake by electrically driven compressors. These companies were amalgamated in 1912 under the name of the Northern Canada Power Company. Electric power is delivered at the mines for $50 per horse power per year, and the compressed air at 24c. and 25c. per 1,000 cubic feet at 100 pounds pressure. These prices represent a saving to the mining companies of over 50 per cent. of the cost of generating power by the use of coal, and have enabled the larger companies to increase their mining operations without increasing their power plants. This power reduces the cost in opening up new work, the construction of plants being obviated.

Concentration

One of the greatest advances in the economic treating of the cobalt-silver ores is in concentration. On account of the narrowness of the veins and the stringers of ore branching off from the main veins, it has been found that, no matter how carefully this ore is sorted, a considerable amount of silver is left in the rock. This averages from 10 ounces per ton up to 50 or 75 ounces. To recover this, the present system of concentration has been adopted. In 1908, when the third edition of this Report was published, there were five concentrating mills in Cobalt having the following capacities:—

	Tons per day.
Buffalo	60
Coniagas	50
Cobalt Central	60
Northern Customs	50
Ore Reduction Co.	40
Total	260

On January 1st, 1913, the following companies had concentrating mills in operation and in course of construction having the respective daily capacity:—

Mill.	Capacity per day.	No. of stamps.	Remarks.
1 Beaver	90 tons	Crushing by rolls	Increasing capacity in 1913.
2 Buffalo	145 "	" "	
3 Cobalt Central	75 "	" "	
4 Cobalt Lake	75 "	20	Doubling capacity in 1913.
5 Colonial	25 "	10	
6 Coniagas	180 "	60	
7 Dominion Reduction	120 "	40	Customs mill.
8 Hudson Bay	60 "	20	
9 King Edward	30 "	10	
10 McKinley-Darragh-Savage	165 "	30	Adding 20 stamps.
11 Nipissing	200 "	40	
12 Nipissing Reduction	50 "	Crushing by rolls	Customs mill.
13 Northern Customs	350 "	120	" "
14 O'Brien	100 "	30	
15 Silver Cliff	75 "	Crushing by rolls	
16 Temiskaming	125 "	40	
17 Trethewey	100 "	30	
Outlying camps.			
18 Casey-Cobalt	30 "	10	Doubling capacity in 1913.
19 Wettlaufer	30 "	Crushing by rolls	
20 Miller Lake-O'Brien-(Millerett)	30 "	10	Recently purchased from Millerett by Miller Lake-O'Brien
Totals	2,055 tons	470 stamps	

Fig. 111.—O'Brien concentrator, Cobalt.

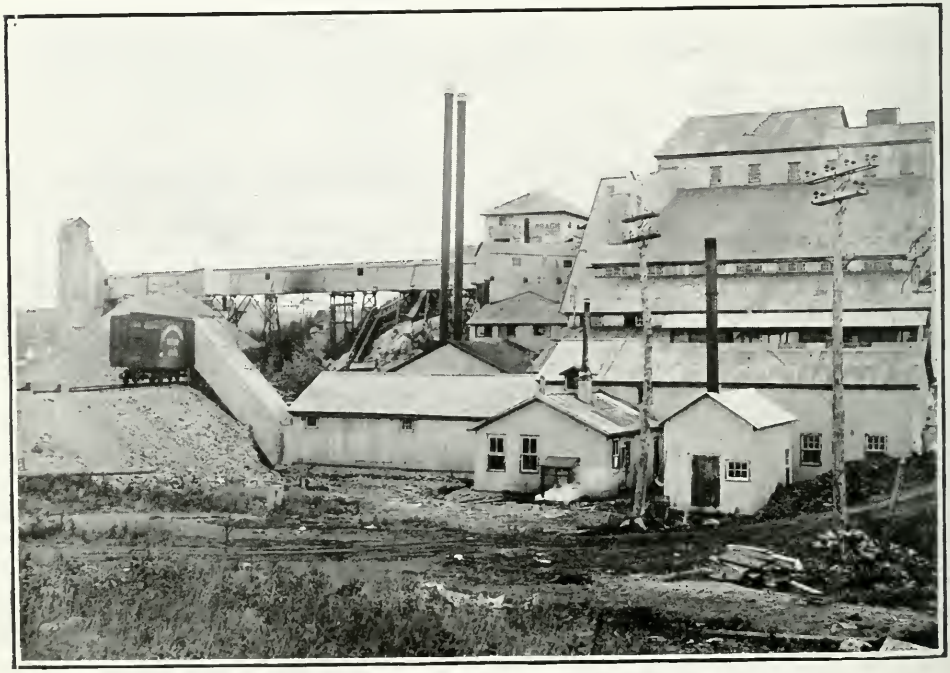


Fig. 112.—McKinley-Darragh mill and shaft house, Cobalt.

Computing this concentration on a basis of 40 tons of rock milled, yielding 1 ton of concentrates, the mills will produce 51.3 tons of concentrates per 24 hours, or in 310 working days in the year 15,903 tons of concentrates. At an average value of 900 ounces per ton of concentrates, the total amount of silver produced by the mills would be 14,312,700 ounces. However, it must be borne in mind that, owing to breakdowns, etc., the mills very seldom operate to their full capacity. Three of the mills mentioned above use water concentration and cyanidation of the tailings. The other mills use water concentration solely. A number of other mines have adopted concentration of their coarser material. All the producers of ore do a certain amount of hand picking, either from bumping tables or travelling belts, but at the Cobalt Provincial, Crown Reserve, Kerr Lake, La Rose and Savage mines, jigs have been installed to make a better saving of their finer material. The average grade of rock sent to the mill is about 25 ounces per ton, though it sometimes runs as low as 10 ounces and as high as 75 to 100 ounces. The average recovery in the mills is about 80 per cent. of the silver values. Thus in a 25-ounce ore, the recovery is 20 ounces, and the loss in the tailings 5 ounces. The average milling cost is approximately $3.00 per ton of rock treated, thus the profit on 25-ounce ore would be as follows:—

One ton ore	25	ounces
Less 20 per cent. milling loss	5	"
	20	"
Smelters pay for 90 per cent., or for 18 ounces silver at 60c. an ounce	$10 80	per ton
Less milling cost	3 00	"
Profit	$7 80	"

Practically the same principle is adopted in all the mills, the only difference being in the details of the treatment. The majority of the mills use jaw crushers and stamps for crushing, and reduce the ore to 15 or 20 mesh. Some of the mills use tube mills for fine grinding.

The flow sheet, Fig. 110, illustrates the general method adopted in the mills in the camp.

In some of the mills the tailings from the sand tables, as outlined in (2) on flow sheet, are reground in tube mills, classified and then treated on slime and sand tables, and then over canvas tables. A great variety of tables are used at the various mills. Among the tables used are the Wilfley, Deister, James, Frue Vanner, Overstrom and Traylor. The weight of stamp used throughout the camp is 1,250 pounds, and crushing in the stamps to from 16 to 20-mesh, if there is no re-grinding.

Smelting

In the early days of the camp there was little competition among the smelting companies in buying cobalt-silver ores. On January 1st, 1913, there were nine companies buying these ores. Three of these smelting companies have their plants located in Ontario. They are as follows:—

1. Coniagas Reduction Company, Thorold.
2. Deloro Mining & Reduction Company, Deloro.
3. Canada Refining & Smelting Company, Orillia.

The three companies mentioned treated more than 50 per cent. of the total number of ounces of silver shipped from the camp in 1910.

The other companies buying cobalt-silver ores are:

1. American Smelting & Refining Company, New York, U.S.A.
2. Balbach Smelting & Refining Company, Newark, N.J.

Fig. 113.—Crown Reserve Mine, Cobalt.

Fig. 114.—La Rose main vein, 1905.

3. Pennsylvania Smelting Company, Pittsburg, Pa.
4. United States Metals Refining Company, New York.
5. Beer, Sondheimer & Company, Frankfort-on-Main, Germany.
6. Government of Saxony, Saxony, Germany.

Considerable silver is also refined at Cobalt itself. An interesting account of the refinery at the Nipissing mine has been recently published.*

Accidents and Labour

There have been, up to December 31st, 1912, in both the producing and non-producing mines of Cobalt and vicinity, 114 men killed above and below ground. The value of the total production of Cobalt, up to the above date, is about $81,000,000. To produce this amount of wealth, it cost the lives of 114 men. This means that an average of one man was killed to produce ore to the value of approximately $710,000. In the gold mines of the Transvaal, the average for five years shows that one man was killed in producing ore to the value of approximately $200,000. In the coal mines of the United States, statistics show that for an average of the last five years, there has been one man killed in producing 174,390 tons of coal.

When the Cobalt silver mines were discovered and mining work begun, there was a scarcity of skilled miners, and it was necessary to take on unskilled workmen and train them. In addition, on account of the veins being narrow, in some cases a mere crack developing ore within a few feet, numberless shafts were sunk all over the camp. This prospect work of shaft sinking is more hazardous than after a mine is developed and work well organized. In Europe, most of the metal mines have been worked for years and employ many more men, on the average, than do the mines and prospects of Canada. Moreover, European miners can be said to have inherited their vocation, in most cases their ancestors having been miners for generations. In Canada, we have little of that class of labour. As a result, the accident rate has been proportionately high. The labour is very cosmopolitan in character, but the majority of the men are Canadians. There are also men from the British Isles, Americans, Finlanders, Swedes, Polanders, Hungarians and Italians employed. The last three nationalities are used largely as surface labourers.

The following table shows the ruling rates of pay for employees at the Cobalt mines: —

Classification.	Average pay per 9-hour shift.
Shift Bosses	$4.00 to $5.00
Timbermen	3.25
Pumpmen	3.25
Machine drillers	3.25
Machine helpers	2.75
Machine drillers in wet shafts	3.50
Machine helpers in wet shafts	3.50
Hand drillers	2.75
Cage tenders	2.50
Trammers	2.50
Pipe fitters	2.75
Engineers	.30 an hour
Firemen	.25 "
Deck tenders	2.50
Surface labourers	2.25
Blacksmith	3.25 to $4.00
Blacksmith helper	2.50
Ore sorter	2.25
Carpenter	3.25

A deduction of 60c. per day is made for board, and $1.00 per month for hospital and doctor's fees.

*R. B. Watson, "Nipissing High Grade Mill, Cobalt." Eng. and Min. Jour. Dec. 7th, 1912.

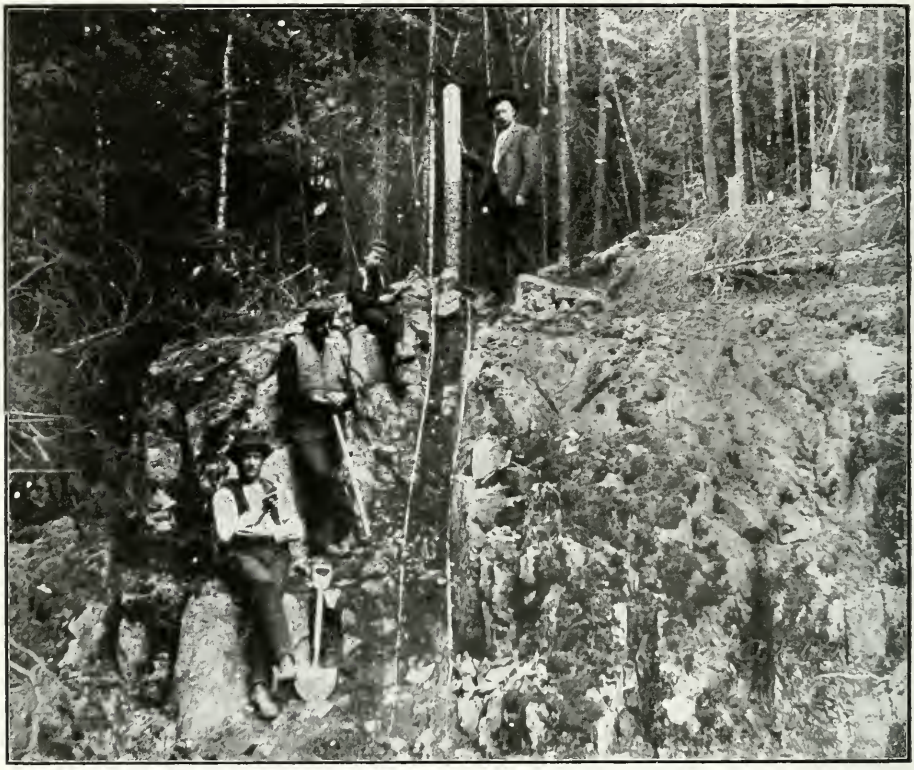


Fig. 115.—Trethewey vein and discovery post, May, 1904.

Fig. 116.—Underground view at La Rose mine, 1905. From a photograph by Mr. A. de Romeu

Explosives

The Mining Act of Ontario only regulates the storage and use of explosives at the mines. There is no regulation regarding the manufacture or statistics to show the amount used.

The manufacture of explosives is a matter of trade and commerce, and as long as the explosive remains in the form of a commodity which is open to purchase and sale, it is subject to the supervision and jurisdiction of the Dominion Government. As soon as it is brought for use on the mining property, regulations passed by the Provincial Legislature govern. It has been felt for some time that the Dominion Government should bring in legislation respecting the manufacture and sale of explosives in Canada, in view of the numerous accidents resulting from explosives. The Dominion Government have had this matter under consideration for three years, but nothing has yet been done. The principal explosives used are dynamite, gelignite and cheddite. The companies supplying the bulk of the explosives are the Canadian Explosives Company, with works at Beloil, Quebec; the Curtiss & Harvey (Canada), Limited, with works at Dragon Station, Quebec; and the Energite Explosives Company, with works at Haileybury, Ontario.

INDEX

PAGE

Abbika creek 111
Abitibi lake 45, 62
Acanthite, in Saxony 213
Accidents in mines 259
Acid intrusives, Cobalt dist.. 55, 56, 70
Acknowledgments ..... xiii.
Actinoceras vertebratum 232
Agaunico (Temiskaming Cobalt) mine 20
Agglomerate.
  Leonard tp., photo 188
Agricultural land 109, 146
Alabama, U.S.
  Silver production 39
Alaska, U.S.
  Silver production 39
Allemont, France 220
Altitudes.
  Florence lake 194
  Gowganda area 168
    Long Point lake 167
  Maple mt. 155
Alveolites niagarensis 231
American Smelting and Refining Co.
  42, 43, 257
Ami, Dr. Henry 229-231
Amphibolite.
  Everett lake 170
  S. Lorrain silver area 140
  Tudhope tp. 155
Anaconda mine 42
Analcime 209
Analysis.
  Aplite dike 70, 104
  Bismuth (native) 15
  Breccia 84
  Calcite 28
  Chloanthite 16
  Clay 110
  Cobalt-silver ore specimen 32
  Cobaltite 20
  Diabase 106
  Dolomite 28, 29
  Dyscrasite 24
  Granophyre 104
  Greenstone 55
  Greywacké 83
  Lorrain granite 70
  Matildite 28
  Mispickel 20
  Nickel ores 104, 129
  Norite 106
  Ore from Nipissing mine 17
    Cobalt lake 19
  Plagioclase 158
  Silver ore specimens 30
  Slate 57
  Smaltite 226
  Smaltite-chloanthite 142
  Tetrahedrite 26
  White bloom 19
"Ance à la Mine" 2, 4
Anglo-French Nickel Co. 224
Aniline dyes, arsenic for 42

PAGE

Anima Nipissing lake 118
  Cobalt bloom 129
  Pyrrhotite 154
Animikie formation.
  Port Arthur district 206
    Kakabeka falls, photo 200
Animikite 201, 205
Annaberg, Saxony.
  Bismuth 12
  Cobalt deposits 8, 214
    Compared with Ontario 216
    Map 215
  Deposition of minerals at 10, 11
  Kersantite at 71
Annabergite (nickel bloom).
  Cobalt, Ont. 12
  Lake Superior deposits.. 197, 201, 205
  Symbol for 9
Anoplotheca hemispherica 230
Anson-Cartwright, R. 49
Antimony.
  Kerr lake mine 24
Anvil lake 118, 155
Apatite 10, 28
Aplite dikes.
  Analysis and notes 70, 104
  Farr and Tudhope tps. 159
  Flanagan lake area 180
  James tp. 144
Appalachian mts., erosion of 114
Aragonite 10
  Notes by Walker 29
Archæan in Scotland 80, 87
Archibald claim 191, 194
Ardagh, E. G. R. 104
Argentite.
  Cobalt dist. 12, 20, 24
  Port Arthur dist. 201, 205
  Saxony 213
  Symbol for 9
Argentite silver mine 55, 72
Argentopyrite 213
Argyropyrite 9
Arizona, U. S.
  Silver production 39
Arkose. *See* Cobalt series and Lorrain arkose.
Armstrong tp. 118
Arsenates.
  Cobalt dist. 9
  Port Arthur dist. 205
  See also Annabergite, etc.
Arsenic.
  See also Arsenious ores.
  Hastings co., plant in 1
  Michipicoten island 209, 210
  Saxony 213
  Statistics 34-36, 41-43
  Uses 42
Arsenical pyrites. *See* Mispickel.
Arsenides 9, 205
  See also Niccolite, Domeykite, etc.
Arsenious ores in Europe 1

PAGE
Arsenolite 9
Arsenopyrite 22, 24
Asbolite 9, 223
Assays.
Ore from Jowsey-Woods mine..... 143
Silver specimens 32-35
Atikokan iron range 58
Atrypa 230, 232
Augite-lamprophyre. *See* Lamprophyre dikes.
Auld tp., silver in 163
Australasia.
Silver production 38
Cobalt in 225
Austria, cobalt in 213
Azurite 205

Bad Vermilion lake 211
Badger silver mine 208
Badger shaft, Mt. Diabase 92, 93
Baker, M. B. 55, 73, 110
Balbach Smelting and Refining Co. .. 257
Baleo, Cal. 226
Balmoral, Transvaal 225
Balsam 168
Banker bay, Gowganda lake 165
Banks tp. *See* Maple mt.
Barber tp. 118
Barite.
Cobalt dist., absence of 28, 97
Gowganda area 98
Porcupine area 9, 28
Langmuir tp. 129, 195
Port Arthur dist. 205
Barlow, Dr. A. E. 98, 131
Notes by, on:—
Glacial striæ, L. Temiskaming.. 110
Rocks of Montreal river 137
L. Temiskaming 228-231
Lake Temagami rep., ref. to 73
Sudbury rep., ref. to 3
Barrie, Ont.
Profile from, to Toronto 233
Bartlett, James .....xi., 49
Bartlett silver mine 180, 186
Bartlett tp. 66
Basalt.
Cobalt dist., notes and photo.... 51-53
Saxony 213, 214
Basic dikes 105, 106
Basic intrusives 70
Bass lake, Sturgeon river .. 45, 103, 118
Bastin, Edson S. 12
Bay lake, Montreal river 118
Geology of area W. of 152-154
Bay of Islands, Bad Vermilion lake.. 211
Beacon silver mine 163
Beaver lake 151, 158
Beaver silver mine, Cobalt dist.
Concentrating plant 255
Depth 8
Dividends 37
Keewatin formation 123
Stock prices 38
Veins 5, 125
Beaver silver mine, Thunder Bay dist. 204
Photo 200

PAGE
Production 208
Beck silver mine 208
Beer, Sondheimer & Co. 259
Bellellea silver mine 142
Ben Lair, Scotland 87
Berckau, Herr 238
Bergeron lake 159
Beyrichia 232
Big Dan claim 20, 22
Bimbowrie, South Australia 225
Birch 168
Bishop silver mine 180
Bismuth.
Cobalt dist., analysis 15
deposition 12
statistics 43
Otter tp. 196
Saxony 213, 250, 251
Shining Tree Lake area..... 190
Thunder Bay dist. 203, 205
Bismuthinite 180, 213
Black lake 189
Blackburn silver mine. *See* Millerett s. m.
Blacksmith's wages 259
Blanche river.
Copper pyrites 59, 131
Course of 116, 117
Diabase 99, 150
Galena 131
Limestone 108
Moraine parallel to 146
Blende. *See* Zincblende.
Blezard lake 104
"Blind veins" 5, 8, 125
Bloom. *See* Erythrite.
Bloom lake 173, 180
Blue color. *See* Cobalt.
Blumenbachii 232
Bohemia. *See* Joachimsthal.
Bonsall silver mine 180
Booms in mining ..... xiii.
Bornite.
Cobalt dist. 10
Symbol for 9
Boston tp. 59
Boulder clay 190, 110
Boulders.
Cobalt series 76
photos 85, 88
Silver-bearing 32, 115
South Lorrain silver area 136
Temiskaming mine 13, 70, 87
Trethewey mine 13, 70, 87
Bowen, N. L.
Analysis by, of dike rock 104
Diabases described by.98, 178, 179, 206
Enstatite found by, Gowganda area 101
Mt. Chemaniss thickness given by. 78
Unconformity found by, in Cobalt series 176
Boyd-Gordon silver mine 180
Bradley silver mine 163
Brady lake 255
Brandenstein, Herr 242, 243
Breccia, analysis 84
Breccia-conglomerate 137, 138

PAGE

Breithauptite 25
La Rose and Hudson Bay mines.. 15
Symbol for 9
Brett lake 172
Bridal Veil falls, Waboose creek.... 169
Briers, Daniel de 244
Brisseau island, L. Temiskaming... 231
Bristol tp. 69
British Canadian Power Co. 141, 142, 255
Broken Hill mine, Australia 225
Brompton lake, Que. 211
Browning tp. 194
Bruchmuller, H. 234
Bryson island, L. Temiskaming.
Glacial striæ 111
Limestone 228, 231
Bucke tp.
Boulder, conglomerate, photo 77
Cobalt conglomerate 64
Columnar structure 84, 85
Contact Keewatin and Cobalt series 79
Glacial striæ 111
Greywacké 66
Keewatin rocks 55, 56
Lamprophyre dikes 71
Map, geological 63
Quartz-porphyry dike 58
Silurian limestone 75
Silver mining in ..... xii.
Temiskaming series 62
Bucknell, David 145
Buffalo silver mine.
Concentrating plant 255
Dividends 37
Keewatin rocks 52
Mispickel 20
Production, 1912 36
Share prices 38
Building stone 107, 231
Bulsch lake 174, 179
Bureau of Mines.
Notes on silver specimens sent to. 30-32
Burke-Renny silver mine 180
Burkhardt, Hans 246-248
Burnt island, L. Temiskaming .. 228-231
Burrows, A. G. ..... xiv., 148
Analyses by, Cobalt Hill ore 17, 18
dolomite 29
greywacké 83
plagioclase 159
quartz-diabases 103
tetrahedrite 26
white bloom 19
Map of Gowganda area by, ref. to.. 49
Notes by, on:—
Elk Lake mines 161-163
Otter tp. minerals 196
plagioclase 160
Premier Langmuir mine 195
Temiskaming series 66
Report by, on S. Lorrain silver area 134-143
Burwash, E. M. 187
Bythotrephis 231

PAGE

Calcite.
Cobalt dist., analysis and notes... 28
deposition 12
La Rose mine, photo. 11
Temiskaming mine, photo 14
with smaltite, photo.. 15
Port Arthur dist..... 201-205
Wright silver mine, photo 130
Calcite creek 178
Calcite lake 186
Calico, arsenic for printing 42
California, U. S., silver production.. 39
Calymene niagerensis 232
Campbell, W. 12
Camptonite 72
Canada.
Arsenic production 42
Nickel-cobalt ores 211, 212
Silver production 38
Canada Refining and Smelting Co... 257
Canadian Copper Co. 41
Canadian Explosives Co., ... 261
Canadian Pacific Railway.
Mineral discoveries due to 2
Caninia 230
Carpenters' wages 259
Carson vein, Crown-Reserve mine... 127
Cart lake 122
Carter, W. E. H. 32
Cartwright's camp, Everett lake. 170-173
Casey Cobalt silver mine.
Concentrating plant 255
Dividends, 1912 37
Notes and developments 148
Casey mt. 145, 147
Casey tp. 118, 129
Notes by Hore 145-148
See also South Lorrain silver area.
Caswell, Grant 191, 194
Cerargyrite 205
Chalanches, France.
Cobalt, notes 220-222
Chalcocite (copper glance)..... 205, 250
Chalcopyrite.
Affected by erosion 115
Cobalt dist. 10
Port Arthur dist. 205
Rosie Creek area 194
Saxony 250
Symbol for 9
Chamberlin, R. T. 114
Champlain, Samuel de 2
Charters tp. 168, 170, 174, 186
Chemaniss mt. 75, 78
Chert 52
See also Sediments (Keewatin).
Chief island, L. Temiskaming.
Glacial striæ 111
Rocks and fossils 230
Chili, cobalt in 225, 227
China, arsenic in 42
Chloanthite (diarsenide of nickel).
Analysis 16
Saxony 213
Symbol for 9
Chown lake 91, 118

PAGE
Chrome, N.J. 43
Churchill, Ont. 228
Cinnabar. *See* Mercury.
City of Cobalt Mg. Co. 37, 38
Cladopora crassa 231
Clathrodictyon fastiguatum 230, 231
Clay 109, 110
Origin of 112
Temiskaming lake 136
Clear lake 57
Climate in past ages 114
Clinton limestone 107, 114, 228
Cobalt (mineral).
Austria 213-219
Australia 225
Canada 211, 212
Cobalt, distribution 129-131
statistics 34, 35, 41
Whitewater lake 154
Chili 227
France 220, 221
Germany 213-219
Saxony, early history 234-251
Metallurgy 227
Mexico 226
New Caledonia 222-224
Norway 222
South Africa 159, 225
United States 226
Cobalt, Ont.
Agricultural land N. of 109
Cobalt series 79
statistics 41
Columnar jointing near 122
Concentrating at 254-256
Deepest mines 8
Dividends from mines of.. xii., 37, 253
Faults 119, 120
Map of dist. 6
mines near 7
Naming of 2
Ores of, character 33-35
richness 125, 126
Photos ..... xiv.-xvii.
Prices of mining shares 38
Profile from, to Toronto 233
Silver mining methods 253
Silver production ..... xi.
Situation and discovery..... 1, 2
Statistics ..... xii., 34-37
Veins, character and origin..... 5-8
compared with Saxony.... 216
Wealth of district ..... xi.
Cobalt bloom. *See* Erythrite.
Cobalt Central silver mine.
Concentrating plant 255
Dividends 37
Share prices 38
Veins 5, 125
Cobalt hill 119
Cobalt Hill vein, Nipissing mine 15
Assay of ore from 32
Description and photo 16, 18
Cobalt Hydraulic Power Co. 255
Cobalt lake.
Analysis of ore from 19
Columnar structure near 84
PAGE
Course of 118
Diabase 93
Fault 75, 96, 119, 120
Cobalt Lake silver mine 255
Cobalt Power Co. 255
Cobalt Provincial silver mine 257
Cobalt salt 17
Cobalt series.
Age and character 48
Blind veins in 125
Bucke tp., map showing 63
Casey and Harris tps. 147, 148
Climate in past ages indicated by.. 114
Cobalt area, photo 44
section 5
Doherty station 60
Fabre series similar to 62
Gowganda area 45, 174-176
Mispickel in 20
Montreal river, W. of 152
Montrose and Midlothian tps..... 67
Notes and photos 73-87
Pense and Ingram tps. 150, 151
Porcupine 69
Productiveness 123, 127
Shining Tree Lake area 188
South Lorrain silver area 137, 139
Temagami Forest reserve..... 157, 158
Temiskaming lake 108
Cobalt-silver ores.
Specimens of, notes on 32, 33
Statistics 35
See also Silver.
Cobalt Silver Queen, Ltd.
Dividends 37
Share prices 28
Cobalt Townsite Mining Co.
Dividends paid by 37
Production, 1912 36
Cobaltite.
Analysis 20
Otter tp. 196
Symbol for 9
Cochrane
Profile from, to Toronto 233
Coin clippers 240
Cole, Arthur A..... xii., 22, 35, 36
Coleman, Prof. A. P. 29
Lake Ojibway report by, ref. to.. 109
Sudbury report by, ref. to 3
Views of, on origin of Cobalt conglomerate 87
Coleman tp.
Greywacké 81
Iron formation 59
Quartz-diabase 103
Collins, W. H. 73, 76, 78, 98, 171
Notes by, on Florence, Shining Tree and Rosie Creek areas 194
Colonial silver mine 90, 91
Concentrating plant 255
Colorado, U. S.
Silver production 39
Columbus silver mine 20
Apatite 28
Basalt 50
Graphite schist 57

PAGE

Columnar structure.
Bucke tp. 84, 85
Columnaria 230
Colvocoresses, G. M. 182
Compania de Penoles 42
Concentrating at Cobalt 255, 257
Conglomerate.
Bucke tp. 64
Cobalt series, boulders 86, 88
origin 87
notes 85
photo 84
thickness 77
Cross lake 62
Hudson tp., iron in 58
McKinley-Darragh mine, photo.... 44
Midlothian tp. 66
Millerett silver mine 168
Obushkong lake, photo 175, 176
Porcupine, Ont. 69
Rabbit lake, photo 61
Scotland 80, 87
Silver values in 132
Temiskaming series, photo..... 77
Whitney tp. 68
Wright silver mine 130
See also Cobalt series.
Coniagas Reduction Co. 41, 227, 257
Coniagas silver mine.
Concentrating plant 252, 255
Cost of mining 127
Dividends 37
Dip of rocks 119
Granite boulders with silver... 13, 70
Keewatin rocks W. of..... 50, 54, 72
Production, 1912 36
Specimen from, notes on 32
Stock prices 38
Veins, narrow 124
photo of outcrop 122
Contact bay, Giroux lake 50-52
Copper.
L. Superior 209
Copper Cliff refinery 36
Copper glance 205
Copper pyrites.
Blanche river 59, 131
Gowganda dist. 180
Lebel tp. 59
Mattawapika river 131
Shining Tree area 190
Silver Islet mine 201
Sudbury dist. 3
Temagami 59
Corkill, E. T. ..... xiv., 141
Notes by, on Casey-Cobalt mine... 148
Elk Lake mines.... 161-163
Report by, on Mining methods at Cobalt 253-261
Corundum, Hastings co. 1
Cosala, Mexico 226
Courtis, W. M. 197
Cragg vein. *See* Elk lake.
Crawford lake 177, 178
Crawford silver mine.
Diabase 180
Glacial striæ 168
Cross iron mine 211

PAGE

Cross lake.
Basalt-diabase dike 105, 106
Galena 131
Iron formation 57, 59
Lamprophyre dikes 71, 72
Nipissing diabase.....91, 94, 100, 105
Temiskaming series 62, 64
Crown Reserve silver mine.
Cost of mining 127
Diabase 93, 94
Dividends 37
Dolomite analysis 29
Jigs 257
Keewatin rocks 54, 56, 58
Photo 258
Production, 1912 36
Specimen from, photo 31
Stock prices 38
Cryderman silver claim 172
Crystals.
Illustrations, mispickel 21, 23
smaltite 18
Notes on various minerals 22-28
Culbert, M. T. 91, 101
Currie silver mine 159
Curtiss and Harvey 261
Cyril lake 100

Daillebout seig., Joliette co., Que.... 211
Dalton Thomas silver mine 192
Dana, Prof. J. D. 114
Danaite 211
Dane, Ont.
Profile from, to Toronto 233
Darby lake 158
Darby silver mine 192
Davidson lake 169, 172, 173, 178
Dawson pt., L. Temiskaming 231
Delisle, Guillaume 2
Deloro Mining and Reduction Co...36, 41, 42, 227, 257
DeLury, J. S. 20
Report by, on Area West of Bay lake 152-154
Dendrocrinus longidactylus 232
Denudation and Deposition 112-115
Deserted lake 158
Diabase.
Casey and Harris tps. 146
Cobalt dist. ..... xii., 54-56
Gillies tp. 208
photo 95
sections 91-102
Cobalt bloom in 129
Gowganda area. 101, 165, 168, 181, 186
Mattawapika river 131
Montreal river, West of 152
Port Arthur dist. 206
Saxony 213
Silver in 123, 127, 132
Table hill 206
Temagami Forest Reserve 158
Diabase mt. 93, 102
Diabase pt., Giroux lake.... 99, 100, 103
Diarsenide of cobalt. *See* Smaltite.
nickel. *See* Chloanthite.

PAGE
Dinny lake 171, 172
Diorite dikes, Norway 222
Discosorus 230, 232
Disturbances. *See* Faults.
Dividends, Cobalt mines.... xii., 37, 253
Saxony mines 218
Dog teams, Gowganda lake, photo... 167
Montreal river, photo... 164
Doherty station 60
Argentite silver mine 72
Dolerite.
Dollar (U. S.).
Silver equivalent of gold 40
Dolomite.
Cobalt, Ont. 12, 28
Port Arthur dist. 205
Dome gold mine 66, 68
Domeykite 201, 205
Dominion iron mine 211
Dominion Reduction Co. 255
Donaldson silver mine 161
Donavan tp. 186
Doré river, L. Superior 46
Drummond silver mine.
Boulder conglomerate, photo 86
Dividends not made public 37
Iron formation near 59
Nipissing diabase 92-94
Porphyry 56, 64
Drunken island 111
Dufferin silver mine 180
Duhamel tp. 111
Dwyka formation 87
Dyes, arsenic for aniline 42
Dymond tp.
Cobalt bloom 129
Limestone 108, 119-121
Dynamite island, Giroux lake.... 52, 99
Dyscrasite.
Cobalt, analysis and notes 24
with mercury 13
Symbol for 9

Edison silver claim 154
Egypt.
Cobalt used in, for glass coloring. 41, 224
Einigkeit shaft 213, 216
Electricity for Cobalt mines 255
Elizabethtown, Ont. 211
Elk City, photo 164
Elk lake, Montreal river.
Aplite dikes 104
Barite and fluorite 9, 28
Conglomerate 141
Map of adjacent area 156
Mining on 161-163
Photo 159
Elkhorn lake 171, 177
Emmons silver mine 203
Emplectite.
Floyd mine 10, 28
Symbol for 9
Enamel, arsenic for 42
Energite Explosives Co. 261

PAGE
England.
Cobalt imports from New Caledonia 224
Diabase sill 98
Englehart, Ont.
Profile from, to Toronto 233
Eozoic. *See* Pre-Cambrian.
Eplett claim. *See* Caswell, Grant.
Erosion, Cobalt dist. 112-115
series 75, 113
Erythrite.
Anima-Nipissing lake 154
Cobalt, Casey-Cobalt mine 145
deposition 12
description 19
Nipissing mine 17
Florence lake 194
Ingram tp. 129
Lake Superior dist. 197, 205
Silver islet 201
Saxony 250
Shining Tree Lake area 190
Symbol for 9
Transvaal 225
Various occurrences 211
Erzgebirge mts., Saxony 214
Eulytite 250
Euomphalus 230, 232
Europe.
Accidents in mines 259
Evanturel tp. 150
Everett lake 170, 171
Exploration Syndicate of Ontario... 193
Explosives 261

Fabre series 62
Fabre wharf, L. Temiskaming 78
Farr island, L. Temiskaming .. 228, 229
Farr tp. 159
Farr's quarry, Haileybury 107
Faults.
Appalachian mts. 114
Cobalt series 75
Notes 116-121
Favosites gothlandica 230, 231
Feldspar.
Frontenac co. 1
Whitson tp. 158, 159
Feldspar-porhyry 56
Felsite.
Crown-Reserve mine 56
Lawson mine 52, 56
Sasaginaga lake 58, 64
Ferland-Chambers silver mine..... 50
Fire, at Gowganda 165
See also Forest fires.
Fireworks, realgar for 42
Flanagan lake 176, 178, 180, 186
Fleming corners, Bucke tp. 64
Fletcher, Hugh 209
Florence lake 194
Floyd mine 10, 28
Fluorite.
Cobalt dist., absent 28, 97
Gowganda area 98
Porcupine area 9, 28, 98, 129
Foley-O'Brien gold mine 68

PAGE
Foot lake 170
Forest fires.
Gowganda area 168
S. Lorrain area 134
Forneri claim. *See* Frontier s. m.
Fossils.
L. Temiskaming 229-232
Foster Cobalt Mining Co.
Dividends paid by 37
Keewatin rocks 52
Share prices 38
Fournier lake.
Iron formation 187
Silver claims 190
Stratified sand 189
France.
Arsenic production 42
Cobalt imports from New Caledonia 224
See also Chalanches.
Frederick House river.
Profile from, to Toronto 233
Fredericktown, Mo. 226
Freeman, Dowler 187
Freibergite 9
Friese, Hans 246, 247
Frontenac co.
Feldspar and mica 1
Frontier silver mine..... 143, 144
Frying-pan lake 174
Furs, arsenic for preserving 42

Gabbro.
Ingram and Pense tps. 149
Montreal river, W. of 152, 153
Temagami Forest reserve 158
Galena.
Affected by erosion 115
Cobalt dist. 2, 4
Wright silver mine 131
Occurrences 131
Port Arthur dist. 201, 205
Rosie Creek area 194
Shining Tree Lake area 190
Symbol for 9
Wendigo lake, S. of 149
Galt, Gerald 145, 149
Garnets 64
Gas, inflammable.
L. Superior silver area.
Geikie, Sir Archibald.
Notes by, on columnar structure.. 85
fissures 122
origin of clay 112
Gem silver mine.
Geological Survey of Canada ..... xi.
Geology.
Bay lake, W. of 152-154
Cobalt dist. 44-115
Gowganda silver area 168-179
Harris and Casey tps. 145-147
Ingram and Pense tps. 149, 150
Montreal River dist. 155-159
Shining Tree Lake area 187-189
South Lorrain dist. 134-140
Temiskaming lake 228-231
George, Johann 248

PAGE
Georgia, U. S.
Silver production 39
Germany.
Arsenic production 42
Cobalt deposits 213
See also Saxony.
Gibson, T. W. 2, 3
Gillies tp., diabase 208
Giroux lake.
Basalt 50-52
Diabase 99, 100
See also Diabase mt. and Diabase pt.
Glacial deposits. *See* Pleistocene.
Glacial striæ 110, 111
Maple mt. 159
Myrtle lake 168
Temiskaming lake 136
Glaciation.
Gowganda area 168
Removes silver ore 32, 109
Glass, arsenic and cobalt for 41, 42
Glasser, A. 223, 224
Glaucodot 22
Gneiss.
Cobalt dist., origin 60
Temiskaming lake ... 45
Gold.
Big Dan claim 22
Chalanches, France 220, 221
Deloro 42
Porcupine area 1, 115
in Temiskaming series 62, 66
Rabbit lake 129
Temiskaming Cobalt mine 20
Wright silver mine 131
Goldschmidt, Prof. V. 25
Goodwin lake 91, 118
Gowganda.
Photo of post-office 165
Gowganda area.
Barite 9
Diabase and Cobalt series.. 45, 78, 101
cut by aplite dikes 104
Lavas 66
Map of, colored. With Report.
Silver, report by Burrows 165-186
statistics, 1912 36
Temiskaming series 62, 113
See also S. Lorrain silver area.
Gowganda lake 165
Altitude 168
Dog team on, photo 167
Rocks 172-176
Silver 180
trenching for, photo 181
See also Mann s. m.
Graham tp. 211
Grand Trunk Railway.
Profile of, from North Bay to Toronto 233
Granite.
Bloom lake 180
Cobalt dist., age 60
Temiskaming lake .. 47
mine 70, 123
University mine 104

PAGE
Lake Huron 46
Relation between, and Cobalt series 158
Lorrain granite.
See also Aplite dikes.
Grant co., Or. 226
Graphite.
Nipissing and La Rose mines..... 15
Port Arthur dist. 202, 205
Graphite schist 57
Gravenhurst.
Profile from, to Toronto 233
Great Lakes, The.
Map of (ancient) 4
Great Whin diabase sill 98
Greave, E. L. 191
Green, W. F. 19
Green lake 150
Greenstone.
Gowganda area 170
Michipicoten island 209
Montreal river, W. of 152
Notes 50
Photo 44, 53
Torsion cracks 55, 56
Wendigo lake 151
Grenville series, thickness 113
Greywacké.
Bucke tp. 66
Cobalt hill 16
Cobalt series, analysis and notes. 81, 83
columnar structure... 84
overlying diabase ... 177
Photomicrograph 80
Gowganda silver area 174-177
Montreal river 138
Night Hawk lake 68
Nipissing mine 82, 85
Origin 112
Photos 44, 82
Red Sucker creek 69
See also Cobalt series.
sediments (Huronian).
Guanacevi, Mexico 226
Guiges tp., striæ 111
Gunnison co., Col. 226

Haileybury.
Bedded clay near, photo 109
Cathedral at, photo 107
Profile from, to Toronto 233
Explosives works at 261
Rocks 229
dikes 71
basalt 50
Keewatin 80
Temiskaming series 62-65
Haileybury Frontier Mg. Co. *See* Frontier silver mine.
Haileybury Silver Mining Co. 143
Halysites 230
Hargrave silver mine.
Rocks 54, 56, 64, 93, 94
analysis 29
Harrer, Hans 237
Harris, Capt. John 25
Harris tp.
Glacial striæ 111

PAGE
Notes by Hore 145-148
Hastings co. 1
Hastings series 62
Haultain tp., forest fires 168
Hedlund, L. O. 193
Henwood tp. 118
Herron lake 189
Heterogenite 9
Heubachite 9
Highlands of Scotland 80, 87
Historical notes.
Saxony mining 234-258
See also Chalanches.
Hitchcock silver mine 163
Holland, colour works in 235
Holy Cross cathedral, photo 107
Hore, R. E.
Reports by, on:—
Area South of L. Wendigo.. 149-151
Townships of Casey and Harris 145-148
Hornblende-lamprophyre. *See* Lamprophyre dikes.
Hornblende schist 170, 171
Horseshoe lake 192
Hovey, Dr. E. O. 87
H. R. 250 location 181
Hubert lake 159
Hudson bay, Silurian 228
Hudson Bay Mining Co. 186
See also next item.
Hudson Bay silver mine.
Breithauptite 15
Concentration plant 255
Dividends 37
Keewatin 95
Share prices 38
Hudson river, N.Y. 98
Hudson tp., iron 58
Hunt, T. Sterry 211
Huntilite 201, 205
Huronian.
Cobalt dist. 127
L. Huron 46
See also Cobalt series.
Keewatin once included in ..... xi.
Hutchison, William 32
Hutton iron range 58

Idaho, U.S., silver production 39
Illinois, U.S., silver production 39
Imperial Bank, Gowganda, photo... 165
Imperial Cobalt silver mine 103
Indian lake, Montreal river 163
Ingall, E. D. 29
Extracts from Rep. by, on L. Superior silver deposits..... 197-210
Ingram tp. 118, 129, 149
See also Wendigo lake.
Ink, sympathetic 17
Insecticide, arsenic for 42
Iron, Cobalt dist. 58, 59
Northern Ont. 1
See also next item.
Iron formation.
Fournier lake 187
Gowganda area 170, 172
Notes 57-59, 112, 113

PAGE

Iron pyrites.
Affected by erosion 115
Canadian occurrences 211
Cobalt dist. 10, 59
Silver islet 201
South Lorrain silver area 140
Symbol for 9
Wright silver mine 211
Italy, arsenic production 42
Iturbide, Mexico 226

Jack pine 168
Jackman, H. E. 91
James, O. S. 18
James Bay slope 113
James tp.
Aplite dikes 144
Map 156
Mines 161
Rocks 158
Japan, arsenic production 42
Jarvis Mining Co. 208
Jaspilyte.
Gowganda silver area 171
Keewatin sediments 48, 57, 112
JB 7 location. *See* Trethewey silver mine.
JB 53 location 154
Jenitz, Hans 236
Joachimsthal, Bohemia.
Cobalt 8, 213-216
Pitchblende 10
Johnny lake, Montreal river 118
Jowsey-Woods silver mine 143
JS 163 location 159
Judge P. O. 146

Kaiser Josef shaft 213, 216
Kakabeka falls, photo 200
Kapff, Friedrich 234
Keeley mine.
Altitude 134
Arsenopyrite crystals 22
Notes 142
Keewatin formation.
An iron formation 112
Blind veins in 125
Cobalt district:—
Age and character 48, 112
Bucke tp. map 65
photo 79
faults 120
iron pyrites 59
ores of 58
lesser values 132
photos and notes 44, 70-77
Section showing 5
silver in 123, 127
Dikes intruding 71, 72
Gowganda area 170-172
Harris tp. 147
Ingram and Pense tps. 149, 151
Mapped as Huronian ..... xi.
Midlothian and Montrose tps. 67
Montreal river, W. of 152
South Lorrain silver area 139
Temagami forest reserve 155

PAGE

Temiskaming lake, Que. 121
Whitney tp. 68
Keewatin-Laurentian complex 60
Kenogami lake, Blanche river 116
Kenrick, E. B. 211
Kerr claim, Otter tp. 196
Kerr lake.
Diabase 92, 94, 99
Iron formation 57
Kerr lake silver mine.
Cost of mining 127
Dikes 71
Dividends 37
Dyscrasite 24
Jigs 57
Nipissing diabase 93, 99
silver in 123
Production, 1912 36
Section showing No. 3 shaft 92
Share prices 38
Silver from, removed by glaciation 32
Kerry lake 159
Kersantite.
Annaberg 71, 219
L. Superior region 72
Keweenawan formation 120
Kiahkusagainda lake 66
Killarney, Ont. 46
King Edward (Watts) silver mine.
Keewatin rocks 52
Nipissing diabase 90, 91, 101
Plant at, for concentrating 255
King George silver mine 142
Kinogami. *See* Kenogami.
Kirk lake.
Diabase 97
Garnets 64
Granite 70
Lamprophyre dikes 71, 72
Temiskaming series 62, 64
Knight, Cyril W. 58, 83
Acknowledgments to ..... xiii., 45, 49
Cross-sections by 91
Descriptions by, of rocks 50-58, 98
Notes by, Casey-Cobalt mine 148
Cobalt-silver ores 12
Report by, on Montreal river and Temagami Forest reserve.... 155-163
Views *re* Fabre series 62
structure of gneiss 60
Kobold. *See* Cobalt.
Kongsberg, Norway 12, 222
Kreifinger, Herr 239
Kruis river, Transvaal 225

Labor at Cobalt 259
Lady Evelyn lake 131
Lake Erie 114
Lake Huron.
Cobalt 212
Huronian 26
Sedimentary deposits 114
Lake Superior.
Diabase 98
Dikes 72
Silver 197-210
Lake Temiskaming silver mine..... 111

PAGE
Lambe, L. M. 231
Lamprophyre dikes.
Cobalt (Ont.) mines 48
Distribution and petrography 71
Relation to adjacent formations.. 72
Lane, Dr. A. C. 119
Langmuir tp.
Barite and fluorite 9, 28, 98, 129
Cobalt series 69
Mining in, notes 195
Laperriere bay, striæ 111
Larder Lake.
Cobalt series 76
Temiskaming series 45
La Rose silver mine.
Basalt 52
Breccia 84
Breithauptite 15
Chloanthite 16
Diabase 93, 101
Dividends 37
Dyscrasite 24
Faults 94-97, 120
Graphite 15, 57
Jigs 257
Niccolite 15, 33
Ore from, photo of polished 11
Parallel veins in, photo 124
Production, 1912 36
Pyrargyrite 25
Slate 119
Stock prices 38
Underground view, photo 260
Vein, photo of main 258
Lataif silver mine 178, 180
Latchford 81, 116, 118, 119
Laurentian.
Contact with Cobalt series..... 147
Gowganda silver area 173
Granite and gneiss, notes 47, 113
Temagami Forest reserve 157
Laurentian-Keewatin complex 60
Lavas, Gowganda area 66
Lawson, Dr. A. C. 206
Lawson silver mine..... 52, 54, 56, 58
Lawson tp., barite 9
Lead, arsenic for hardening 42
Leather, arsenic for preserving 42
Lebel tp. copper pyrites 59
Ledoux, Dr. A. R. 125
Leith tp. 168, 171, 174
Leonard tp. 9
Geological map. With Report.
Lepha lake 163
Leptæna rhomboidalis 230, 232
LeRoy claim 150
Leroy lake 170, 171, 178
Les Grandes Sables 46
Lewisian formation 80
Lichenalia 232
Liege Exhibition, Belgium 32
Limestone.
Bucke tp. 75
Climate in past ages indicated by.. 1[illegible]
Haileybury 107
Temiskaming lake 45, 228, 229
See also Niagara limestone.

PAGE
Little Dan claim, Temagami 20, 22
Little Nipissing silver mine.
Diabase 90, 91, 94
Dikes 71
Quartzite overlying greywacké.... 85
Little Silver (Cliff) mine 32
Cobalt series 11, 62, 81, 150
greywacké 83
Loch Maree, Scotland 87
Logan, Sir William 45, 46, 108, 228
Logan lake 177
London, Eng., silver prices 40
London purple 43
Londonderry, N.S. 211
Long Lake. *See* Cobalt, Ont.
Long lake, Blanche river 116
Long Point lake 167
Loon lake 134, 137, 140
See also Frontier silver mine.
Lorrain arkose.
Cobalt series 75, 89
South Lorrain silver area 139
Temiskaming lake 121
Lorrain granite.
Age and character 47
Analysis and notes 70
Intrusion of 113
Kirk lake 64
Relation of, to gold deposits 115
S. Lorrain silver area 139
Temiskaming lake, Ont..... 47, 48, 64
Que. 121
Lorrain quartzite.
Rosie Creek area 194
Temiskaming lake 98, 121
Lorrain tp.
Arkose 78
Striæ 111
Lost lake, Gowganda dist... 104, 174, 178
Louisiana Purchase Exposition 32
Lower Huronian. *See* Cobalt series.
Lumsden silver mine.
Diabase 94
Keewatin rocks 54, 58
Lyellia 231

McArthur tp. 66
Macfarlane, T. 205
Macfarlanite 201, 205
McGregor tp. *See* Three A silver mine.
Machine drillers' wages 259
McIntosh silver mine 192
McIntyre tp. 203
McKay mt., L. Superior..... 199
McKellar island, L. Superior..... 202
Mackenzie silver mine 163
McKim tp. 211
McKinley-Darragh silver mine.
Basalt 52
Concentrating plant 255
Diabase 93
Dividends 37
Fault 95, 96, 120
Greenstone 53
Lamprophyre dike 71, 72
Mill and shaft house, photo..... 256
Photo taken from 44
Production, 1912 36

PAGE
Share prices 38
Vein, strike of 119
McMillan, J. G.
Notes by, on Temiskaming series.. 66
Work by, Midlothian tp. 73, 78, 113, 170
McNeill, W. K. ..... xiv.
Madgeburg, Holland 235
Madoc tp. 211
Mallard lake 149, 150
Manganiferous carbonate.
Analyses and notes 29
Mann island, L. Temiskaming... 228, 231
Mann silver mine 180, 185, 186
Maple mountain 118
Altitude 155
Cobalt series 78
Cobalt-silver ores 129
Glacial striæ 159
View from, photo of 157
Silver mining near ..... xii.
Maps.
Annaberg area, Saxony 216
Cobalt, north of 63
dist. ..... 6 and witn Report
mining properties 7
Porcupine-Sudbury region. 47
Delisle's and Champlain's, ref. to.. 2
Elk lake and adjacent area 156
Gowganda silver area... 166 and with Report
Great Lakes (ancient) 4
Ingram and Pense tps. 150
L. Superior, north shore 198
Leonard tp. .....With Report
Midlothian and Montrose tps. 67
North America, pre-Cambrian areas ..... xviii.
Notes ..... xi., 49
Regional disturbances 117
Schneeberg area, Saxony 217
Marcasite.
Saxony 213
Silver islet 201
Maree, Loch, Scotland 87
Marion, Ky. 226
Marter tp. 150
Martineau bay, L. Temiskaming..... 98
Maryland, U.S.
Silver production 39
Matheson, Ont.
Profile from, to Toronto 233
Matildite 9
Analysis 28
Mattagami river.
Profile from, to Toronto..... 233
Sedimentary rocks 68, 69
Mattawapika river 131
Mattawin iron range 58
Mercury.
Cobalt dist. 10, 13, 24
Saxony 250
Silver islet 205
Meristella 230
Metallurgy, Cobalt dist. 227
Mexico.
Cobalt 226
Silver production 38

PAGE
Mica 1
Mica-lamprophyre. *See* Lamprophyre dikes.
Michigan, U.S.
Keweenawan formation 120, 129
Silver production 39
Michipicoten island, L. Superior.... 129
Notes on mineral ores 209, 210
Mickle, George R. 127
Notes by, on cobalt mining 216
History by, of early cobalt mining, Saxony 234-251
Microphotos. *See* Photomicrographs.
Middleburg dist., Transvaal 225
Midlothian tp.
Fragmental rocks 73
Map 67
Temiskaming series. 66, 73, 78, 113, 170
See also Sinclair mt.
Miller lake 170, 179
Miller Lake-O'Brien silver mine.
Calcite vein 182
Concentrating plant 255
Dividends private 37
Notes and photo 183-185
Production, 1912 36
Millerett silver mine.
Conglomerate 168
Dividends private 37
Notes and photos 182, 183
Production, 1912 36
Purchase of 255
Millerite.
Bohemia 213
Brompton lake, Que. 211
Cobalt dist., rare 10, 20
Symbol for 9
Milne silver mine 180
Milner tp. 171, 174
Mimetite 250
Mine La Motte, Miss. 226
Minerals.
Cobalt dist. deposition 10-12
list of 9
notes on 13-29
Northern Ont., in pre-Cambrian ... 1
Port Arthur dist. 205
Miners. *See* Labor.
Mining booms ..... xiii.
Mining methods.
Cobalt, notes by Corkill..... 253-257
Mining shares.
Cobalt dist., dividends and prices. 36, 37
Mirador cobalt mine, Mex. 226
Mispickel.
Analyses 20
Crystallization 21-23
McIntyre tp. 203
Saxony 213
Symbol for 9
Mississagi river 46
Missouri, U.S.
Silver production 39
Modum, Norway 249
Montana, U.S.
Silver production 39

PAGE
Monticuliporidæ 230
Montreal river.
Course 118, 119
Clay 136
Prospectors on, photo 164
Rocks 137
See also next item, Bay lake and Elk lake.
Montreal River area.
Cobalt series 76
Diabase 103
Dikes 104
Geology 155-159
Striæ 111
See also S. Lorrain silver area.
Montrose Cobalt Mining Co. 142
Montrose tp. 67
Moose bay, L. Temiskaming 45
Moose Horn silver mine 161
Moose island, L. Temiskaming 228
Moose river 45
Moraine 146
Morne Saint Martin 87
Morrison silver mine 181
Mountain portage, Blanche river.... 108
Mud lake 103
Mullan, Mr. 192
Muller, Herman 216, 217
Murchisonia 230, 232
Murray silver mine 145
Myrtle lake 168, 174, 178

Neelands' claim 191
Nellie lake 191
Nellie Lake Syndicate 191
Neudeck, Saxony 235
Neustadtlein, Saxony 244, 247
Nevada, U.S.
Silver production 39
New Caledonia.
Cobalt 222-225
New Liskeard.
Clay 109
Limestone 75, 108
Profile from, to Toronto 233
Temiskaming series 62-65
New Mexico, U.S.
Silver production 39
New South Wales.
Cobalt statistics 225
New York, N.Y.
Silver prices at 40
Niagara limestone.
Bucke tp. 63
Casey and Harris tps. 146
Climate of past ages indicated by. 114
Dymond tp. 119-121
Haileybury, analysis 107
Temiskaming lake 228
Niccolite.
Cobalt, La Rose mine 11, 15, 33
order of deposition 12
Port Arthur dist. 201, 205
Saxony 213
Shining Tree Lake area 190
South Lorrain silver area 140
Specific gravity 18

PAGE
Sudbury deposits 3
Symbol for 9
Nickel.
Canadian occurrences 211, 212
Cobalt 34
Michipicoten island 210
Rabbit lake 129
Silver islet 197, 203
Sudbury 1, 223
Europe 8
France 216
Saxony 213
New Caledonia 222-224
Nickel bloom. *See* Annabergite.
Nickel eruptive, analysis 104
Nicol, Prof. William 18
Apatite found by, Cobalt dist..... 28
Notes by, on pyrargyrite and stephanite 25
Nicol tp. 168, 174
See also Wilson lake.
Niederpfannenstiel, Saxony 249
Night Hawk lake 68
Nipissing diabase.
Age and character 48
Bucke tp. 63
Casey Cobalt mine 148
Cross lake 105, 106
Diabase mt. 93, 102
Giroux lake 52
Gowganda silver area..... 45, 177-186
Ingram and Pense tps. 149
Intrusion of 113
Midlothian tp. 67
Montreal river, W. of 153
Notes and sections 5, 90-97
chemical and microscopical. 98-100
Peterson lake, N. of 100
Photos 44, 91, 102
Shining Tree silver area 188
S. Lorrain silver area 137
Nipissing Reduction Co. 255
Nipissing silver mine.
Bismuth 15
Calcite 29
Cobalt series 62, 82, 95
Concentrating plant at 255
Dikes 71, 72
Dividends 37
Graphite 15
Greenstone 50
Hydraulic plant 70
Keewatin formation 123
Matildite 28
Mining, cost of 127
Production, 1912 36
Prospecting trenches 132, 133
Quartzite 85
Rocks, dip of 119
Shaft house, photo 252
Share prices 38
Vein, character and origin.
Nomenclature.
Cobalt 2
Cobalt, Ont. 2
Cobalt series 73
Nipissing diabase 91

PAGE
Norite 99, 103
North America.
Map showing pre-Cambrian areas. xviii.
North Bay 36
North bay, L. Superior 209
North Carolina, U.S.
Silver production 39
North Dome gold min 68, 69
North Williams tp. 193
Northern Canada Power Co. 255
Northern Customs concentrator 255
Notch, The, Montreal river 137, 138
Nova Scotia.
Erosion of gold-bearing rocks 114
Nova Scotia silver mine.
Diabase 91
Veins of, character 5, 125
Nugget silver claim 99

Obabika lake 118, 119
Oberschlema, Saxony 247-249
O'Brien silver mine.
Basalt 50
Concentrating plant 255, 256
Diabase 90, 101
silver in 123
Dikes 71
Dividends private 37
Dolomite 29
Production, 1912 36
Obushkong lake.
Forest fires 168
Photo of, in distance 169
Rocks, Cobalt series 83, 174
diabase 178, 179
Keewatin 171
photos 175, 176
Oehme, Herr 247
Olary, S. A. 225
Olivine diabase.
Obushkong lake, W. of 179
Shining Tree silver area 188
Sudbury dist. 105, 106
Onaping area 104
Ontario.
Minerals 1
Railway building .....xiii.
Refineries 36
Silver production 253
Oregon, U.S.
Silver production 39
Ores.
Cobalt dist., list of 9
Ontario, refineries for 36
Orford tp., Que. 211
Orillia refinery 36, 257
Orpiment 42
Orthis 232
Orthoceras 232
Oster island, L. Temiskaming..... 231
Otter creek, Blanche river 118
Otter tp. 129, 196
Oxbow lake 137, 140

Pakowagaming lake 46
Paleozoic.
L. Temiskaming 48
notes by Barlow 228-231
PAGE
Silurian limestone 107, 108
Palisades, The, Hudson river 98
Palmer, Chase 12
Paper, arsenic for printing 42
Paris green 42, 43
Parks, William Arthur 78, 150
Paulson bay, L. Temiskaming 119
Payen, Marie 220
Pelée mt. 87
Pennsylvania, U.S.
Erosion in 114
Silver production 39
Pennsylvania Smelting Co. 259
Penoles, Compania de 42
Pense tp. 149, 150
Pentamerus oblongus 232
Percy island, L. Temiskaming.. 228, 229
Perth Amboy, N.J. 43
Peterson lake.
Blind veins under 125
Diabase 90, 91, 100
Dikes, kersantite 219
lamprophyre 70-72
Silver vein near, character 5
Petrography.
Amphibolite 140
Diabase 99-103, 146
basalt 105
Nipissing 137
olivine 179
Granite 173
Greywacké 138
Hornblende-lamprophyre 71
Keewatin rocks 50-57
Porphyry 140
Syenite 147
Temiskaming series 64, 66
Phænopora expansa 232
Philippine islands.
Silver production 39
Photomicrographs.
Greywacké 80
Hornblende-lamprophyre 71
Quartz-diabase 100, 101
Piché pt., Temiskaming lake... 108, 111, 230, 231
Pickerel lake 118
Pie island, L. Superior 203
Pigeon river 208
Pihuamo, Mexico 226
Pine 134, 168
Pitchblende (Uraninite) 10, 213
Plagioclase 158
Platystrophia biforata 232
Pleistocene deposits.
Casey and Harris tps. 146
Cobalt dist. 109-111
Gowganda area 168
Shining Lake area 189
South Lorrain area 136
Polybasite.
Cobalt dist. 25
Saxony 213
Symbol for 9
Poplar 168
Porcupine area.
Barite and fluorite 9, 195

PAGE
Cobalt series 69, 73
Gold 1, 115
in Temiskaming series ... 62, 66
Index map 47
See also Langmuir tp.
Porcupine Junction.
Profile from, to Toronto 233
Porcupine silver mine, Thunder Bay dist. 204, 208
Porphyry.
Wright silver mine 130
Port Arthur.
Barite and fluorite 28
Diabase 98
Manganiferous carbonate 98
Silver, report by Ingall 197-210
Port Macquarie, N.S.W. 225
Portage bay 103
Porto Rico.
Silver production 39
Portugal, arsenic production 42
Post Tertiary. *See* Pleistocene.
Pottery, cobalt for 41
Power development at Cobalt 255
Powerful silver mine 186
Pre-Cambrian (Eozoic).
Age and subdivisions 48
Casey and Harris tps. 146
Gowganda area 168
Minerals in 1, 120
North America, map ..... xviii.
Premier Langmuir Mining Co. 195
Preston, W. A. 208
Prince's silver mine 202, 206, 211
Princess silver mine 96
Production of Cobalt mines.. xii., 35-37
Prospecting 132
Montreal river 164
Nipissing mine 133
Proustite.
Cobalt dist., rare 24
Saxony 213
Symbol for 9
Prudential silver mine 161
Prussia.
Cobalt production 225
See also Germany.
Pterinea 230
Pucherite 251
Pumice, as origin of clay 112
Pumpmen's wages 259
Pyrargyrite.
Crystals, notes and sketches 25
Saxony 213
Symbol for 9
Pyrite. *See* Iron pyrites.
Pyrotechnics, realgar for 42
Pyroxene 1
Pyrrhotite.
Anima Nipissing lake 154
Sudbury dist. 3, 223
See also Nickel.

Quartz.
Cobalt veins, rare 28
Quartz-diabase.
James tp. 159
PAGE
Microphotos 100, 101
Quartz-porphyry.
Gowganda, photo 172
Saxony 213
Temiskaming lake 56, 64
Quartzite.
Cobalt series 72, 89
Lake Huron 46
Montreal river, W. of 152, 153
Nipissing mine 85
North Dome mine 69
S. Lorrain silver area 139
Temiskaming lake 18
Thickness of, at various points.... 78
Quebec Mining Co. 209
Querbach, Silesia 234
Quinze river 45, 105

Rabbit lake.
Cobalt-nickel-gold ore from 129
Conglomerate 61
Course of 118, 119
Quartzite 73
Temiskaming series 60
Rabbit Mountain silver mine 199
Mines near, notes on 204
Production 208
Radio-active water 251
Radium 10, 216
Railway building.
Mineral discoveries due to ..... xiii.
Red Sucker creek, Mattagami river.. 69
Reeve-Dobie silver mine 180
Refineries 36
Regal silver mine 163
Regional disturbances. *See* Faults.
Rhodocrosite 29, 201
Rhynchonella 230
Rib lake, Montreal river 118
Rickard, T. A. 220
Right of Way silver mine.
Diabase 93
Dividends paid by 37
Stock prices 38
Vein in, length of 124
Rittingerite 213
River bay, L. Temiskaming 45
RL 404 location 197, 219
Robbins, P. A. 96
Roche McLean, L. Temiskaming.... 111
Rocks. *See* Geology, Petrography.
Roehling, Herr 240
Rogers, W. R. xiv
Romeu, A. de 260
Rorke tp. *See* Maple mt.
Roselite 9
Rosenbusch, Prof 55, 103
Rosie creek, Wanapitei river 194
Round lake, Blanche river 117
Ryan, P. A. 2

St. George silver mine 219, 234
Sandstone.
Michipicoten island 209
Temiskaming lake 45
Sandy portage, Montreal river 119
Sasaginaga creek 50, 57

PAGE
Sasaginaga lake.
Acid intrusives 55
Diabase 93
Felsite 58, 64
Savage silver mine 257
See also McKinley-Darragh s. m.
Saxony.
Arsenious ores 1
Cobalt mining, history..... 234-251
veins 214, 216
Scapolites 1
Schneeberg, Saxony.
Cobalt-silver mining 234-249
veins 214, 216
Map of mining area 217
Schnorr, Herr 246, 247
Schroeder, R. 24, 25
Schuerer, Christian 235
Scorodite 9
Scotland.
Pre-Cambrian 80, 87
Scott, W. B. 98
Sections.
McKay mt. 199
Nipissing diabase 90-97
Notes 49
Sediments (Keewatin).
Cobalt dist. 57
Seneca-Superior silver mine 37
Serpentine.
Gowganda area 171
New Caledonia 223
Serpentine lake 171
Seville Exploration Syndicate .. 190, 191
Shamrock silver mine 50
Sharp lake 28
See also Floyd mine.
Sharp Lake Mines, Ltd. 142
Sharp Landing, Temiskaming lake 58, 68
Shining Tree Lake silver area.
Agglomerate 188
Mining 193, 194
Notes by Collins 194
Report by Stewart 187-192
Short lake 118
Shot, arsenic for hardening 42
Shuniah silver mine 208
Silurian.
Bucke tp. 75
Limestone 107, 108
Temiskaming lake 48, 228
Silver.
Bohemia 213
Casey and Harris tps. 145-149
Cobalt, Ont.
boulders containing 32, 115
distribution 129, 130
notes on native 13
origin 12
photos 14
production 34, 35
estimated 128
specimens 30, 31
Gowganda area 165-186
L. Superior area 28
notes by Ingall 197-210
PAGE
Montreal river and Temagami Forest Reserve 155-163
Bay lake, W. of 152-154
Saxony 214-218, 234-251
Shining Tree Lake area 189-193
South Lorrain area 133-144
Specific gravity 18
Statistics ..... xii., 36-41
Temiskaming lake, Que. 130, 131
Value 40
Wendigo lake, S. of 149-151
See also Argentite, Dyscrasite, Veins, etc.
Silver Bar silver mine 52
Silver Cliff silver mine 91, 255
Silver islet, L. Superior.
Mercury 205
Photo 202
Silver mining 201-205
production 208
Silver lake 159
Silver Leaf silver mine.
Blind veins 125
Diabase 93 94, 100
Silver Mountain silver area 204, 208
Silver Queen. *See* Cobalt Silver Queen, Ltd.
Silvers, Limited 180
Sinclair mt. 66, 75, 77
Skutterud, Norway 222
Slate.
Montreal river, W. of 153
North Dome mine 69
Sasaginaga creek, anaylsis 57
Smaltite (Diarsenide of cobalt).
Chili 227
Cobalt, Ont. 11, 12, 15-18
Ingram tp. 129
Rosie Creek area 194
Saxony 213
Shining Tree Lake area 190, 193
South Lorrain area 140
Specific gravity 18
Symbol for 9
Transvaal 225
Smaltite-chloanthite, analysis 142
Smelting Cobalt ores 257
Smyth tp., gneiss 157
Snarum, Norway 222
Soap, arsenic for 42
Sodalite 1
South Africa.
Cobalt 159, 225
Erosion 114
South Australia, cobalt 225
South Bay silver mine 170
South Carolina, U.S.
Silver production 39
South Dakota, U.S.
Silver production 39
South Lorrain silver area.
Report by Burrows 134-144
Spain.
Arsenic production 42
Cobalt production 225
Spar island, L. Superior .. 202, 206, 207

PAGE
Spawning lake, altitude 168
Specific gravities 18
Specimens of silver.
Notes and analyses 30, 31
Specularite 194
Sphalerite. *See* Zinc blende.
Sphenes 1
Spider lake 188, 189, 192
Spruce 168
Stahl, Christopher 236
Stephanite.
Cobalt dist. 25-27
Saxony 213
Symbol for 9
Sternbergite 213
Stewart, R. B. 73
Report by, on Shining Tree silver area 187-193
Stibnite.
Anima Nipissing lake 154
Rosie Creek area 194
Straight lake, Montreal river 118
Streptelasma 230
Striae. *See* Glacial striae.
Stromeyerite 9, 142
Stropheodonta 232
Sudbury dist.
Dikes 105, 106
Map (Index) 47
Niccolite 2
Nickel 1, 223
eruptive, analysis 104
Norite 99, 103
Sulphantimonites 9
Sulpharsenides 9
Sulpharsenites 9
Sulphides 9
Sulphobismuthites 9
Sutton bay 145
Conglomerate 147
Striae 111
Sutton creek 145
Swastika 45
Sweet silver mine 180
Syenite.
Casey tp. 147
Gowganda area 172, 173
Langmuir tp. 195
South Lorrain silver area 139
Temiskaming lake 45
Sympathetic ink 17
Syringopora 230, 231

Table hill 206
Taxocrinus 232
Taylor, D. 45
T. C., 730 and 731, locations 191
Temagami.
Copper pyrites 59
Iron formation 112
Profile from, to Toronto 233
Temagami Forest Reserve.
Notes on geology and veins ... 155-164
See also Gowganda area.
Temagami lake.
Iron formation 58
Shape 119

PAGE
Temiskaming & Hudson Bay Mining Co.
Dividends paid by 37
Stock prices 38
Temiskaming & Northern Ontario Ry.
Silver discoveries due to ..... xiii., 2
Notes on construction of 116
Profile of, from North Bay to Cochrane 233
Temiskaming Cobalt mine (Agaunico) 20
Temiskaming lake.
Altitude 134
Fault parallel to 119, 120
Glacial striae 110, 111, 136
Photo of, part of 136
Rocks 45-48, 121, 228-231
basalt 50
Cobalt series 79-81
diabase 98
greywacké 78, 137
lamprophyre dikes 71, 72
limestone 107, 108
quartz-porphyry 56, 64
quartzite 139
Temiskaming series 62, 65
Silver 130, 131
mining 2, 4
Temiskaming Mining Co.
Dividends 38
Temiskaming silver mine.
Concentrating plant 225
Depth 8
Dividends 37
Production, 1912 36
Rocks, diabase 64, 94
dolomite 29
granite 70, 123
Keewatin 50-54, 123
Silver in, photo 14
Stock prices 38
Vein of, character 5, 125
Temiskaming series.
Age and character 48, 113
Basic and acid intrusives in ..47, 70-72
Bucke tp. 63, 65
Conglomerate boulders 77, 85
Laurentian pebbles in 60
Midlothian tp. 65, 66, 113, 170
map 67
North Dome mine, photo 69
Occurrences 45, 62-69
Petrography 64, 65
Structure and relationships 62-64
Whitney tp., section showing 68
Tennessee, U.S.
Silver production 39
Tetrahedrite.
Analysis 26
Saxony 213
Silver islet 201
Symbol for 9
Texas, U.S.
Silver production 39
Thessalon river, L. Huron 46
Thirty years war 240
Thorold refinery 36
Three A silver mine 203, 208, 213

PAGE
Three Nations lake 66
Three Nations mine 68
Thunder Bay silver area.....28, 98
Report by Ingall 197-210
Thunder Bay silver mine..... 208
Thysanocrinus liliiformis 232
Timagami. *See* Temagami.
Timber 168
Timbermen's wages 259
Timiskaming. *See* Temiskaming.
Tin 214
Tisdale tp. 69
Title of this report, notes..... xii
Tomstown 149, 150
Topography.
Gowganda area 168
Pense and Ingram tps. 149
Shining Tree area 187
South Lorrain area 134
Toronto.
Profile from, to Hudson Bay slope 233
Torridonian formation 80, 87
Torsion cracks 55, 56
TR 2 location 154
TR 207 location 158
Transvaal.
Accidents in mines 259
Cobalt-silver ores 225
Treacy lake 193
Trees. *See* Timber.
Trematopora 232
Trematospira 232
Tres Puntas, Chili 227
Trethewey, W. G. 30
Trethewey silver mine.
Boulders near, origin of 87
with silver in 13, 70
Concentration plant 255
Diabase w. of 64, 72
Dividends 37
Keewatin rocks 52, 54
Ore from, richness of 126, 127
share prices 38
specimens from 30, 33
vein in, photo 260
width 124
Trout creek 154
Trout lake, S. Lorrain area.....137-140
Diabase near 154
Greenstone 152
Troy, Greece 41, 224
Tudhope tp.
Aplite dikes 159
Keewatin rocks 155
Map 156
Turnbull's claims 190
Turner, N. L. xiv
Analyses by, dolomite 29
dyscrasite 24
greenstone 55
matildite 28
smaltite-chloanthite . 142
Tyrrell tp. 187

United Kingdom.
Arsenic production 42
United States.
Accidents in coal mines..... 259
PAGE
Arsenic production 42, 43
Bismuth imports 43
Cobalt imports 226
Silver production 38, 39
United States Smelting and Refining Company 42, 43
University silver mine 104
Unwin tp. 194
Uraninite. *See* Pitchblende.
Uranium 216, 249
Utah, U.S.
Silver production 39

V lake 154
Van Hise tp.
Forest fires 168
Greenstone 170
Rocks 174
Van Nostrand tp. 158
Vermilion iron-bearing district.
Diabase and basalts 72
L. Huronian sediments 64
Violet silver mine.
Calcite, analysis 29
Diabase, analysis 106
Virginia, U.S.
Arsenic plant 42
Silver production 39
Vogesite 72
Vogt, J. H. L. 12
Volcanic dust.
As origin of clay 112
Von Cotta, Herr 214

Wabi bay, L. Temiskaming.111, 119, 229
Wabi creek, L. Temiskaming 116
Waboose creek 169
Waddell, Dr. J. 18
Wages 259
Walker, Dr. T. L.....29, 104
Wall paper, arsenic for 42
Wall-rock, relation of to ore..... 123
Wallace silver mine 211, 212
Washington, U.S.
Silver production 39
Water, radio-active 251
Water courses 116-119
Watson, R. B.....13, 96, 127, 259
Watts silver mine. *See* King Edward silver mine.
Wawaitin falls, Mattagami river..68, 69
Weidenhammer, Peter 235
Welch silver mine 180
Wendigo lake 118
Area S. of, report on 149-151
Cobalt series 78
Wettlaufer-Lorrain silver mine.
Concentrating plant 255
Dividends paid by 37
Notes 140-142
Production, 1912 36
Stock prices 38
White bloom 19
White Reserve silver mine 163
Whitefish Lake silver area..... 204
Whitefish river, L. Superior..... 211
Whitewater lake 154
Whitney, Prof. J. D. 210

PAGE
Whitney tp. 68
Whitson lake 104
Whitson tp. 129
Wilson, Morley E. 56, 73, 76
Wilson lake 173, 175
Winchell, Alexander 46
Witherite 204, 205
Wittichen, Germany 214
World's arsenic production 42
Silver production 38, 39
Wright creek, Blanche river..... 118
Wright silver mine 111
Notes 130, 131
Wyoming, U.S.
Silver production 39

PAGE
Xanthoconite 9, 24

York-Ontario Silver Mining Co. 91
Young, A. J. 145
Young, Dr. G. A. 73
Young creek 62

Zaffer statistics 41
Zaphrentis 230
Zircon 1
Zincblende (Sphalerite).
Cobalt district, in wall rock.
L. Superior silver area.....201, 202
Mattawapika river 131
Symbol for 9
Wendigo lake, S. of..... 149

Map of

COBALT-NICKEL-ARSENIC-SILVER AREA NEAR LAKE TEMISKAMING, ONT.

To accompany 4th Edition of Report by Willet G. Miller, Provincial Geologist, in Part II of the Nineteenth Report of the Bureau of Mines.

1910

Hon. F. Cochrane, Minister of Lands, Forests and Mines.

Scale - 1 Mile to 1 Inch

1 0 1 2 3 4 5 Miles

NOTES.

This enlarged edition of the map covers the South Lorrain, Gillies Limit, parts of Casey Township, and other areas, in addition to the area covered by the first edition published in 1905. A map of the South Lorrain area, by Mr. A. G. Burrows, was published a couple of years ago. The geology of the Gillies Limit is chiefly by Messrs. James Bartlett, R. B. Stewart and W. M. Goodwin. A contoured geological map of part of the Cobalt area, on the scale of 400 feet to the inch, was published in 1907.

Typical Rock Outcrops.—Good exposures of the Keewatin greenstones are to be seen along the shore of Lake Temiskaming immediately to the south of Haileybury, and along the line of railway between Cobalt lake and Bear lake. The latter exposures contain numerous small cracks filled with white calcite, which serve in distinguishing these rocks from the massive or rather massive greenstone dikes of the Lower Huronian. A typical variety of the Archean is gabbro, later in age than the Keewatin, as can be seen in the first rock cut on the railway south of Haileybury. Between the last and Cobalt station there are various exposures of the conglomerate with granite and schistose pebbles, and of the granite-porphyry dikes of the Lower Huronian. A good contact between the latter series and the Keewatin will be found in the cut on the Montreal River branch of the T. & N. O. Railway, on the shore of Temiskaming. The Lower Huronian here rests on the Keewatin and includes pebbles and angular fragments of greenstone and porphyry, thus clearly showing the unconformity between the two formations. The best contact between the Keewatin and Huronian is to be seen along the line of the Kerr lake branch of the railway, across the track almost opposite the Little Silver mine cliff in the Nipissing property. A contact of the Lower Huronian with the Middle Huronian is to be seen on lot 4, concession XII., of Lorrain. Angular blocks, or shingle, of the former are cemented in the schists of the latter.

The terms Lower and Middle Huronian are here used provisionally. The formations have not been correlated with those to which the names are applied in the vicinity of the north shore of Lake Huron and elsewhere.

Ores.—The chief ores are native silver, smaltite or diarsenide of cobalt, niccolite or arsenide of nickel, chloanthite or a diarsenide of nickel, associated with which are argentite or sulphide of silver, pyrargyrite, or sulphantimonide of silver, dyscrasite or antimonide of silver, erythrite or cobalt bloom, arsenopyrite or what may be called nickel bloom, millerite or sulphide of nickel, native bismuth, bismuthinite or sulphantimonide of copper and bismuth minerals, molybdenite or sulphi-arsenide of iron and occasionally galena. Erythrite and annabergite are the hydrated arsenates of cobalt and nickel, respectively. They are both decomposition products. Asbolite and other minerals of similar origin are present. The more common minerals are galena, copper pyrites, sphalerite, iron pyrites and arsenopyrite, together with cassiterite, magnetite, zircon in small quantities, especially in the country rock. Other minerals are found, but generally in such an impure form that their characters have not been definitely determined. Calcite is the chief vein stone, but some of the veins have little or no gangue. Quartz and fragments of the wall rock are found in some of the ore.

The outcrops of the veins usually show native silver and arsenic bloom. The latter is a good indicator, its delicate green color having a striking appearance. It is apt to be confused with some similar tints of red resin of trees. If the bloom is, however, minutely tested, which can be done in the cover of a cartridge, metallic silver will be found in very fine. If found with borax on charcoal before the blow-pipe, it will form a bead of the resulting glass. The native silver exposed at the outcrops will, of course, be recognized. Its color can be determined by cutting it, and its margin is characteristic. Native bismuth, most often surfaces, looks like silver, but is more easily cut, and on exposure tarnishes a reddish color. This other important mineral in the above list which is not brittle and is easily cut is argentite. Prospectors have mistaken it for lead, but it is black in color.

The veins are narrow; the width of the ore averaging for the veins which have been worked profitably 4 or 5 inches, and may be easily passed over by those accustomed to prospecting in other fields. Fragments of rock should not frequently be blown off the ledges. Blasts are best discovered by the debris in crevices or cracks where its presence was not suspected. Cracks in rocks should be cleaned out with a prospecting pick. A vein of three cms. a few inches in width is worth much labor.

Shipments.—The composition of shipments (carloads) from one of the silver-bearing veins (1), and from a vein which does not carry silver values (2) is seen from the following results of analyses:—

(1)	Per cent.	(2)	Per cent.
Silver	11.41	Cobalt	13.00
Cobalt	11.27	Nickel	7.00
Nickel	5.78	Arsenic	61.74
Arsenic	44.10		

The total production to the end of March, 1910, is shown in table at the foot of the map.

Veins.—The veins occupy almost vertical cracks or fissures which run across the beds of the country slightly inclined from the vertical. Important veins, characterized by the presence of native silver and arsenides of cobalt and nickel, are found in the Keewatin, but they are not so numerous as they are in the Huronian. The most important vein of Cobalt lake, found in the Keewatin, is associated with the diabase.

THE KERR OF LOWER HURONIAN.

Since the Lower Huronian is simply a fragmental series—at one time in the form of gravel and other materials in a state of finer division, which were deposited on the eroded, uneven surface of the Keewatin and Laurentian—it becomes of importance to know what thickness may fill these valleys, old valleys and depressions here. As can be seen on this point is that the explosives on the Kerr lake Cobalt station are about 500 feet higher than similar areas on the shores of Temiskaming, low water level. This being the case, there must in some places have a thickness of at least 500 feet. Below Haileybury rock places it was undoubtedly much thicker.

DISTRIBUTION OF ROCKS.

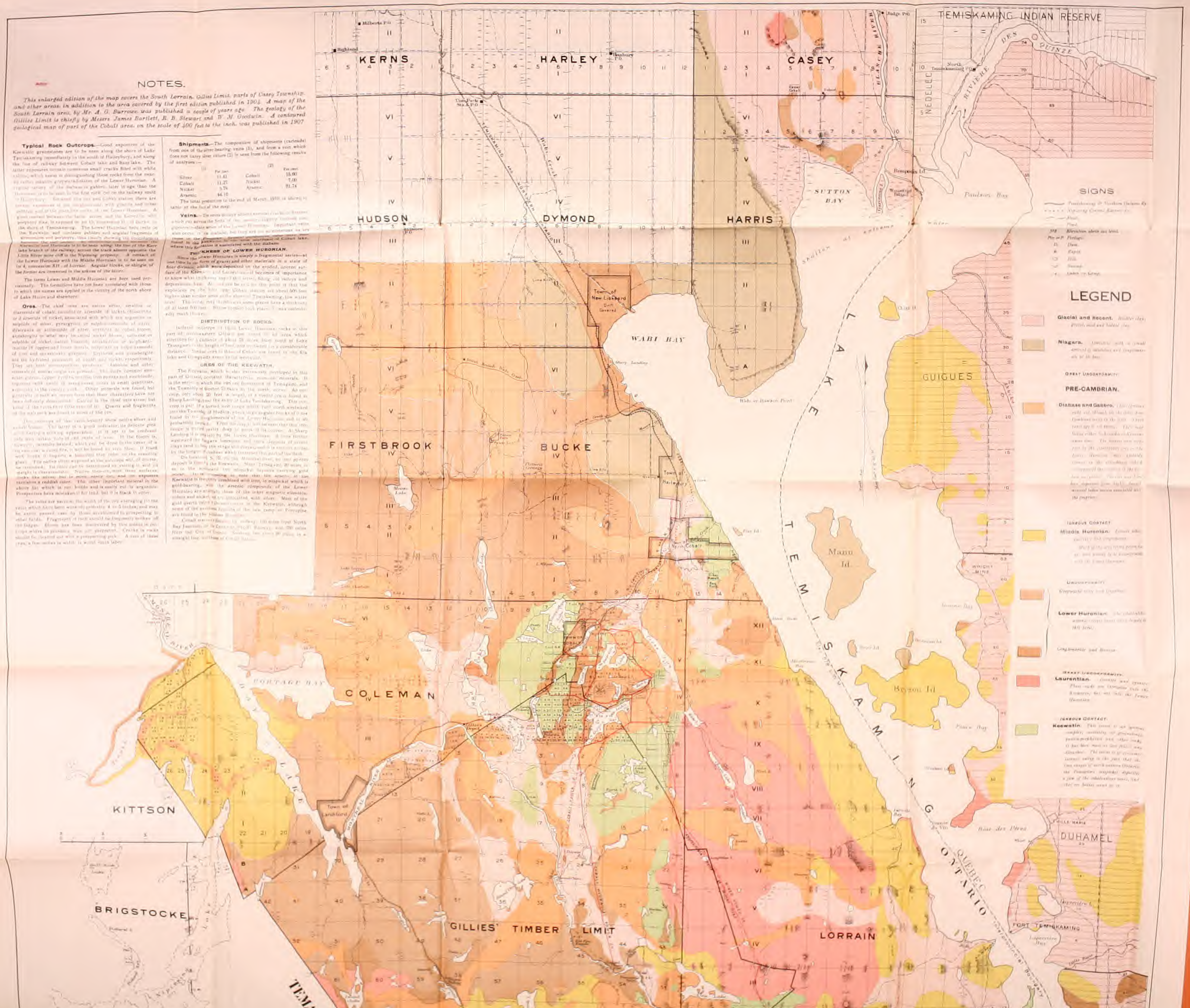
Isolated outcrops of these Lower Huronian rocks in this part of Ontario, eastern Ontario are found in an area which stretches for a distance of about 18 miles from south of Lake Temiskaming to the height of land, and northward for a considerable distance. Similar ores to those of Cobalt are found in the Kirkland Lake and Gowganda areas to the westward.

ORES OF THE KEEWATIN.

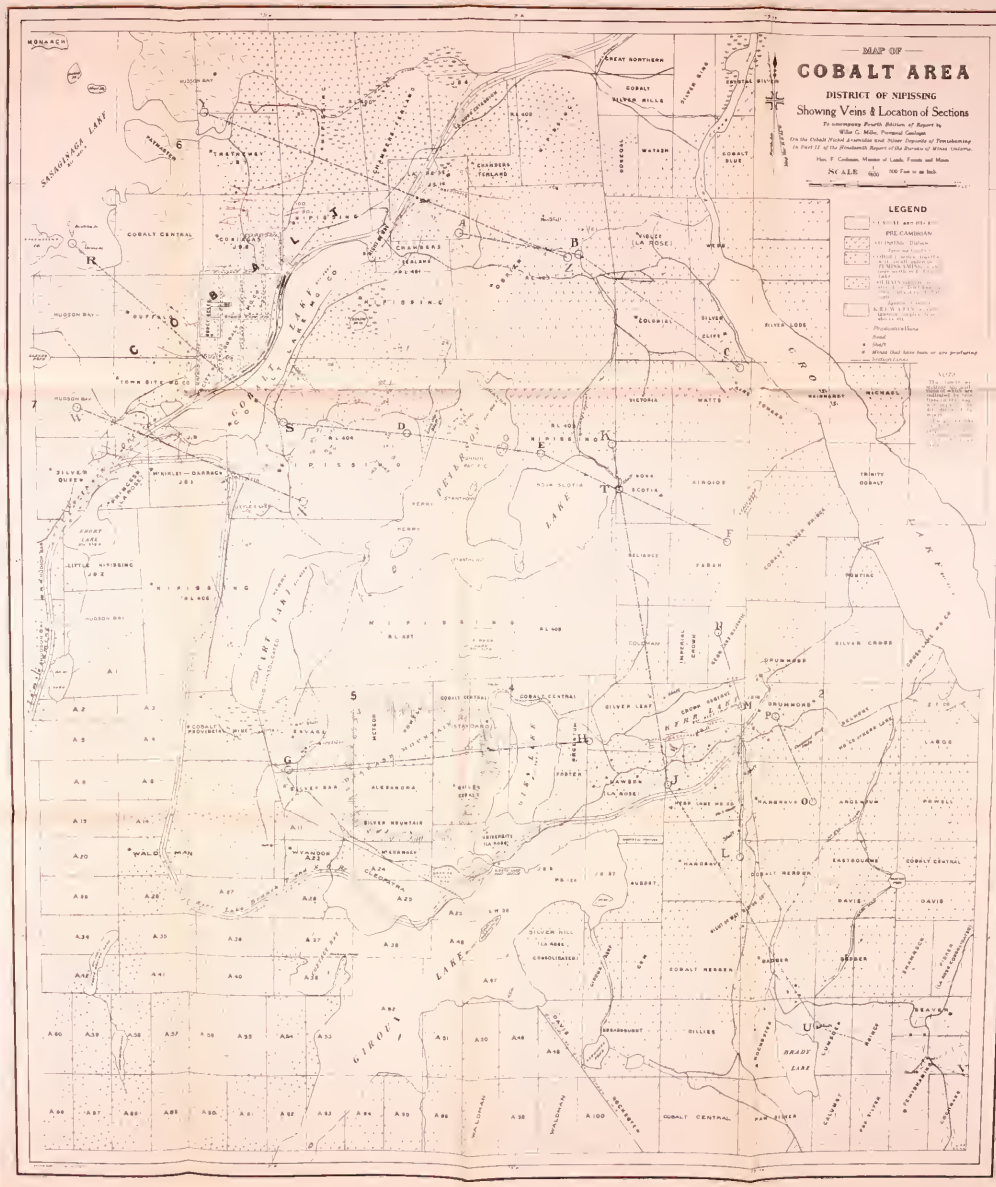
The Keewatin, which is also extensively developed in this part of Ontario, contains characteristic mineralized minerals. It is the series in which the ores are found in the Township of Boston Creek in the north, except. An ore-crop, only about 20 feet in length, of a similar area is found at Sharp Landing, on the north of Lake Temiskaming. This ore-crop is pay. If a buried iron range which runs north-westerly into the Township of Hudson, about six miles distant, is found to be conglomerate of the Lower Huronian and is probably buried. From the crop of ore between that iron range is found pretty deep in places in the country. At Sharp Landing it is covered by the Lower Huronian. A little further westward the Sharp limestone and more deposits of recent days tend to bury the range still deeper, and it is not to be seen by the longer. Diabase which intersects this part of the belt.

On lot number 5, (2), on the Montreal river, are iron pyrites deposits found in the Keewatin. About 12 miles (20 miles in an in the northward run adjacent deposits carrying gold [illegible] to the Montreal River. [illegible] and 200 miles from the City of Sudbury, has given 10 years in a straight line northeast of [illegible].

Cobalt station [illegible] railway, 103 miles from North Bay Junction, on the [illegible] Railway, and 330 miles from the City of Sudbury, has given 10 years in a straight line northeast of [illegible].

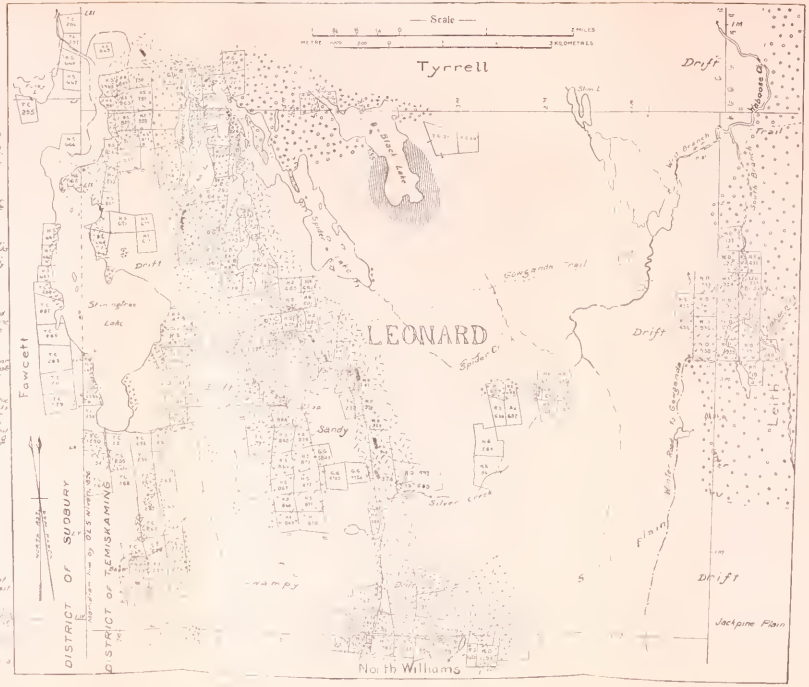


WABI BAY
GUIGUES
FIRSTBROOK
BUCKE
TEMISKAMING
ONTARIO
QUEBEC
Manta Id
Bryson Id
WRIGHT
LAKE
PORTAGE BAY
COLEMAN
KITTSON
BRIGSTOCKE
DUHAMEL
FORT TEMISKAMING
GILLIES TIMBER LIMIT
LORRAIN
SOUTH LORRAIN
FABRE
TEMAGAMI FOREST RESERVE
Niagara.
Great Unconformity
PRE-CAMBRIAN.
Diabase and Gabbro.
Igneous Contact
Middle Hurronian.
Unconformity
Lower Hurronian
Great Unconformity
Laurentian.
Igneous Contact
Keewatin.
SOUTH LORRAIN CLAIMS
NOTES ON THE LAKES
BOUNDS OF INFORMATION
Silver Production Cobalt Mines, 1903 to 1910


MAP OF
COBALT AREA
DISTRICT OF NIPISSING
Showing Veins & Location of Sections
To accompany Fourth Edition, of Report by
Willet G. Miller, Provincial Geologist
On the Cobalt Nickel-Arsenide and Silver Deposits of Temiskaming
As Part II of the Fifteenth Report of the Bureau of Mines Ontario.
Hon. F. Cochrane, Minister of Lands, Forests and Mines
SCALE 1/2000 200 Feet to an Inch
LEGEND
PRE-CAMBRIAN
MONARCH
COBALT CENTRAL
CHAMBERS FERLAND
GREAT NORTHERN
COBALT SILVER MILLS
VIOLET (LA ROSE)
COLONIAL
SILVER CLIFF
SILVER LODE
VICTORIA
WATTS
KERR LAKE
NOVA SCOTIA
TRINITY COBALT
SILVER QUEEN
LITTLE NIPISSING
SILVER LEAF
DRUMMOND
LARGE
WALDMAN
WYANDOT
ALEXANDRIA
SILVER MOUNTAIN
HARGRAVE
EASTBOURNE
DAVIS
BEAVER
BRADY LAKE
GIROUX LAKE
CROWN RESERVE
TEMISKAMING

INSERT
OLD-OUT
OR MAP
HERE!

GEOLOGICAL SKETCH MAP
OF THE TOWNSHIP OF
LEONARD
To accompany Part 2, Volume 19, Report of Bureau of Mines



LEGEND

- Drift — Glacial and Recent. Boulder clay, sand and gravel
- Nipissing Diabase. The diabase occurs largely in the form of dykes. Some of it is probably intrusive in Cambrian rocks, but the majority of large dykes are of pre-Cobalt age
- Cobalt Series. Conglomerate, greywacke, slate, quartzite and arkose
- Temiskaming Series. Conglomerate, greywacke, slate. These rocks have been much disturbed and frequently dip at high angles
- Keewatin. Iron formation (jasper), altered diabase and basalt and greenstone, sometimes schistose from dynamic action
- Unclassified. Quartz and feldspar porphyry, aplite dykes and basalt dykes

Hill
Swamp
Camp
Shaft
Trail

SOURCES OF INFORMATION

Geology in west half of Lucas and Whitehead Tps. Boundary by A.G. Burwash

Mining location and township outlines from Surveyor's Department of Lands and Forests

Topography by the Geological Survey, Canada

Compilation by W.H. Rogers

BINDING SECT. AUG 24 1967